Videnskabelige Meddelelser

fra

den naturhistoriske Forening i Kjøbenhavn

Bind 63.

Udgivne af Selskabets Bestyrelse.

Med 5 Tavler, 1 Kort og 59 Figurer i Texten.

Syvende Aartis tredje Aargang. Vol 73

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Oversigt

over

de videnskabelige Møder

i

den naturhistoriske Forening

i Vinterhalvaaret 1910—11.

Den 28. Oktober 1910. Professor *H. F. E. Jungersen* gav Meddelelse om Slægten Solenostomus (Ichthyotomiske Bidrag III). (Se Afhandlingen „Ichthyotomical contributions. II. The Structure of the Aulostomidæ, Syngnathidæ and Solenostomidæ. Vid. Selsk. Skr. 7. Ser. 8. 1910). Cand. mag. *K. Stephensen* foreviste to snyltende Krebsdyr af Familien Dajidæ paa Sergestes og Acanthephyra fra Davisstrædet („Tjalfe").

Paa Forslag af Professor *Jungersen* vedtoges det at gøre hvert tredje af Foreningens videnskabelige Møder til „Referatmøde". Endvidere vedtoges paa Forslag af Dr. *Mortensen* at ændre Betegnelsen for Foreningens Tidsskrift saaledes at der i Stedet for den hidtil brugte Betegnelse »for Aaret..." sættes „Bind...".

Den 11. November. Dr. *W. Sørensen* holdt Foredrag om Bygningen af Frugten hos vore Geraniaceer og deres Forhold under Modningen (se Afhandlingen „Sur la structure du fruit de nos Géraniacées". Overs. Vid. Selsk. Forh. 1911). Docent *Raunkiær* bemærkede, at selv om Geraniacé-Frugtens Morphologi var urigtig fremstillet i Literaturen, havde det sande Forhold dog været kendt i over 20 Aar, idet han allerede i sin „Excursions-Flora" (1890) paa Basis af egne Undersøgelser havde formet Geraniacéernes Familie-Diagnose i Overensstemmelse med det virkelige Forhold. Dr. *Kolderup-Rosenvinge* spurgte, om Foredragsholderen kendte Steinbrinck's Arbejder, som særlig gaar ud paa at studere de Spændingsforhold, som betinger Opspringningen. Foredragsholderen kendte godt disse Arbejder, men mente, at Steinbrinck slet ikke havde set, at her var et Problem. Pater *Breitung*

gav, paa Grundlag af tidligere Iagttagelser, Oplysning om Griffelhalernes interessante Tilhæftning, som stærkt spændte Fjedre, og om den forbausende Kraft, med hvilken de udslynger Frøet.

Den 25. November. Referatmøde. Dr. *Wesenberg-Lund* foreviste Æg af danske Vandtæger med Oplysning om deres Forekomst. Prosektor *Brinkmann* foreviste: 1) en Skærm til Mikroskoper til Beskyttelse mod Fugtighed fra Aandedrættet; 2) en Methode til Mærkning af Celloidinsnit (med reven Tusch); 3) Blodpræparater (af Tragulus, Kamel og Proteus); gav Referat af Reuter's Arbejde over en ny Kærnedelingsmodus, „Merokinesis". Dr. *Mortensen* foreviste nogle tørrede Asterider, conserverede saaledes, at Farven var bevaret. Mag. *Hj. Ditlevsen* foreviste Syngamus trachealis, fra et Fasaneri (Wilhelmsborg) og gav Oplysninger om denne Iktes Biologi og den Sygdom, den foraarsager hos Fugle.

Den 9. December. Dr. *Wesenberg-Lund* meddelte Bidrag til Phryganeernes Biologi (se Afhandl. „Über die Biologie der Phryganea grandis und über die Mechanik ihres Gehäusebaues". Internat. Rev. f. Hydrobiol. u. Hydrograph. IV. 1911). Stud. mag. *P. Kramp* gav Meddelelse om Laagets Bygning hos nogle Hydroider. (Se Afhandl. „Report on the Hydroids collected by the Danmark Expedition at North East Greenland". Medd. om Grønland, 45. 1911).

Den 20. Januar. Dr. *A. Bøving* gav Meddelelse om anatomiske Forhold af Betydning for Procrustes-Larvens Aandedræt. Docent *Krogh* fremhævede, at den vistnok lokale Sammenpresning af Trachésystemet, som Foredragsholderen havde oplyst at finde Sted, maatte være af stor Betydning for den fuldstændige Fornyelse af Luften i de finere Trachégrene. Ved Kontraktion af Respirationsmuskulaturen samtidig med Tillukning af Lukkeapparaterne kunde Udtømning af Kirtelsekreter og Tarmindhold bevirkes. Det var sandsynligt, at Trykkets Størrelse kunde naa op over 2 Atmosfærer (ifølge Iagttagelser paa Corethra-Larven). Prof. *Jungersen* spurgte, om Chitinskelettets Elasticitet alene virkede som Antagonist mod den muskuløse Sammentrækning af Bagkroppen. Foredragsholderen bekræftede dette. Dr. *Wesenberg-Lund* henledte Opmærksomheden paa Dytisc-Larverne, hvor hele Bugen er blød, og fremhævede, at disse i længere Tid (Vinteren) vistnok slet ikke respirerer ved Hjælp af Aandedrætsbevægelser. (Jf. Afhandl. „Über die Respirationsverhältnisse bei unter dem Eise überwinternden Wasserinsekten, besonders der Wasserkäfer und Wasserwanzen". Intern. Rev. f. Hydrobiol. u. Hydrogr. III. 1910).

Den 3. Februar. Referatmøde. Dr. *Wesenberg-Lund* foreviste forskellige Dytisc-Æg. Assistent *Sell* foreviste Molluskskaller fra Tanganjika-Søen, i hvilken Anledning Dr. *Wesenberg-Lund* gav en Frem-

stilling af de nyere Teorier *(Moore)* om Tanganjika-Fauna'ens Oprindelse. Dr. *J. C. Nielsen* foreviste nogle Muscide-Larver snyltende i Fugle (se Afhandlingen „Mydæa anomala Jaenn., a parasite of South-American birds" i dette Bind). Dr. *Mortensen* foreviste nogle naturlige Bastarder af Echinider (se „Echinological Notes" IV i dette Bind). Lærer *J. P. Kryger* foreviste en Fugleedderkop fra Hareskoven (se Afhandlingen S. 109 i dette Bind). Docent *Stamm* foreviste en i Silkeborg-Egnen fanget Hun af Edderkoppen Eresus cinnaberinus sammen med dens rørformede Spind. I dettes tragtformede, ydre Del laa forskellige indfangede store Insekter, saasom Skarnbasser og Markgræshopper, som udgør denne Edderkops Bytte.

Den 24. Februar. Dr. *Th. Mortensen* holdt Foredrag om Topfeltet hos Echiniderne. (Se Afhandlingen „Echinological Notes" III i dette Bind).

Den 17. Marts. Dr. *V. Nordmann* gav Meddelelse om Boringen ved Skærumhede; det malakologiske Udbytte. (Danmarks Geol. Unders. 2. Række 25.).

Den 31. Marts. Referatmøde. Dr. *A. C. Johansen* fremsatte „Nogle Bemærkninger om Muslingerne paa Vaderne ved Graadyb".

Forskellen mellem dagligt Højvande og dagligt Lavvande er ved Graadyb og Fanø omkring 5 Fod. Hvor Strandbredden skraaner nogenlunde stejlt nedad, og hvor Sandet derfor tørres hurtig ved Ebbetid, træffes der i Reglen ingen Mollusker i det Niveau, der ligger mellem dagligt Højvande og 2 à 3 Fod under dette. — Hvor Stranden skraaner meget langsomt nedad, udtørres Bunden mindre ved Ebbetid, og baade paa Sandvaderne og Slikvaderne er der paa saadanne Steder adskillige Molluskarter, der gaar tæt ind til Kystlinien, Arter som Littorina littorea, Littorina rudis, Paludestrina stagnalis, Paludestrina ventrosa, Mytilus edulis og Cardium edule.

De Muslinger, der lettest iagttages ovre paa Vaderne ved Graadyb og Fanø, er den almindelige Blaamusling (Mytilus edulis L.) og den almindelige Hjertemusling (Cardium edule L.). Blaamuslingen hviler paa Havbunden uden at grave sig ned i denne. Den kan her indtage meget forskellige Stillinger, men hyppigst er det dens afrundede bageste Del, der rager længst i Vejret. Den fæster sig ved sin Byssus til Stene, Molluskskaller og andre faste Genstande, og Individerne viser en Tilbøjelighed til at klumpe sig sammen. Dens Udbredelse er meget ujævn. Der findes store Strækninger paa Sandvaderne, hvor den ikke forekommer, og der findes andre Strækninger, hvor den er saa almindelig, at den danner hele sammenhængende Kager. Dette er fortrinsvis Tilfældet, hvor der findes noget Grus imellem Sandet. Dens Hyppighed er

gennemgaaende størst i det Niveau, der ligger omkring dagligt Lavvande og indtil et Par Fod under dette. — Den almindelige Hjertemusling hviler undertiden umiddelbart paa Havbunden uden at grave sig ned i denne. Man finder den f. Ex. ikke sjelden i Mytilushobene. Men i Reglen graver den sig et lille Stykke ned i Havbunden, ca. 1—3 Centimeter, hvad der svarer omtrent til Længden af dens Siphoner. Den har en mere jævn Udbredelse end Mytilus edulis, men der er dog Omraader, hvor den slet ikke træffes. Paa Slikvaderne kan man finde de ganske unge Individer siddende paa Zosterabladene ligesom de unge Individer af Mytilus. — Macoma baltica L. er vistnok lige saa hyppig paa Vaderne som den almindelige Hjertemusling, og ligesom denne træffes den dels hvilende paa Havbunden, dels nedgravet i Sandet eller Slikken. Langt de fleste Individer findes nedgravede, og de sidder her i ca. 2—10 cm Dybde. Paa Sandvaderne mellem Esbjerg og Maade Teglværk havde Foredragsholderen paa en halv Kvadratmeter fundet 36 nedgravede Individer. Paa de med Zostera bevoxede Slikvader findes Macoma ofte paa Havbunden under Zosteradækket. Voxne Individer af Macoma baltica gaar ikke slet saa nær op til Niveauet for dagligt Højvande som voxne Individer af de to foregaaende Arter. Højere oppe end ca. 1 Fod under dagligt Højvande var den ikke truffet. — Den almindelige Sandmusling (Mya arenaria L.) er ligeledes almindelig paa Vaderne ved Graadyb og Fanø, men den gaar ikke saa højt op imod Kystlinien som de foregaaende Arter. Først i et Niveau, der ligger 2 à 3 Fod under Niveauet for dagligt Højvande, finder man dens Spor, og den bliver nu mere og mere almindelig fra dette Niveau ud imod Lavvandsniveauet. Dens Hyppighed er imidlertid meget ujævn, paa visse Steder havde F. søgt den forgæves. Ganske unge Individer var truffet paa Slikvaderne, liggende paa Siden; men voxne og halvvoxne Individer sidder dybt nedgravede i Sand- og Slikvaderne, de store Individer indtil ca. 20 cm nede i Havbunden. Paa Sandvaderne ved Fanøs Nordøstspids var fundet indtil 5 Individer paa $^1/_2$ Kvadratmeter. — Scrobicularia plana D. C. er almindelig i den ydre Del af Vaderne fra ca. 3 Fod under Højvandsniveauet til Lavvandsniveauet. Man maa grave i Sandet for at kunne paavise den. Den efterlader ikke noget tydeligt og karakteristisk Spor i Sandet, naar den trækker sine Siphoner ned, saaledes som Sandmuslingen gør det. Paa Sandvaderne ved Nordøstpynten af Fanø tæt ved Lavvandsmærket var fundet 9 Individer paa $^1/_2$ Kvadratmeter, dybt nedgravede i Sandet. Ligesom de fire foregaaende Arter forekommer den baade paa Sandvaderne og paa Slikvaderne.

De fem her nævnte Arter af Muslinger er de for Vaderne ved Graadyb karakteristiske Arter. Andre Muslinge-Arter havde F. hidtil ikke truffet der ovenfor Niveauet for dagligt Lavvande.

Under stærke Regnskyl oversvømmes Vaderne af Regnvandet, og de langsomt skraanende Flader kan da i Timevis overskylles af Vand, der er helt fersk eller næsten fersk. De Mollusker, der lever paa Vaderne udviser dér en vis Haardførhed overfor Paavirkning af lidet saltholdigt Vand, en Haardførhed, som disse Arter maaske ikke oprindelig har været i Besiddelse af. Det er da ogsaa karakteristisk at lægge Mærke til, at de fire af de fem anførte Arter, Mytilus edulis, Cardium edule, Macoma baltica og Mya arenaria er de af alle danske Saltvandsmuslinger, der kan tage Ophold i det ferskeste Vand. Alle disse Arter af Saltvandsmuslinger — og ingen andre Arter — gaar helt ind gennem Østersøen op i den Bottniske Bugt, hvor de lever i Vand af en Saltholdighed fra ca. 3 til 6 Promille[1]). Ogsaa den 5te af Arterne, Scrobicularia plana, kan leve i Vand af ringe Saltholdighed. Den gaar i vore Farvande ind i den vestlige Østersøs østlige Del. Dens Fremtrængen mod Øst standser her ved en Saltholdighed af ca. 10 Promille. Imidlertid er det ret sandsynligt, at denne udpræget sydlige Arts Fremtrængen mod Øst i Østersøen ikke standses paa Grund af en for ringe Saltholdighed af Vandet, men paa Grund af en for lav Temperatur i en vis Tid af Aaret.

Tæt under Niveauet for dagligt Lavvande kommer der ved Graadyb en Række andre Muslingearter til, saaledes bl. a. Ostrea edulis (i de indenfjords Farvande), Mactra subtruncata Mtg. samt de tre borende Former Zirphæa crispata L., Pholas candida L. og Petricola pholadiformis Lam. En af disse Arter: Petricola pholadiformis er ny for den danske Fauna og aabenbart nylig indvandret til vore Kyster. Foredragsholderen fandt den første Skal af denne Art paa Skallingens Østside d. 10de Maj 1905 i en nylig opskyllet Skaldynge. Senere er den bleven ret almindelig i Graadyb, og i Sommeren 1910 fandt han dens opskyllede Skaller paa Skallingens Øst-, Syd- og Vestside, saavelsom paa Fanø. Det lykkedes ham i Fjor at tage den levende. Ved Fiskeforsøg, der udførtes med en finmasket Skovltrawl udfor Benknoldene paa Vestsiden af Skallingen i Juli 1910 paa ca. $1^1/_2$ Meters Dybde, toges der en Del fedt Ler op i Travlen, i hvilket der fandtes talrige Boremuslinger. Det viste sig, at disse Muslinger tilhørte de to Arter: Petricola pholadiformis og Zirphæa crispata.

Petricola pholadiformis er en amerikansk Art, der først i den nyere Tid synes at være overført til Europa. Den opdagedes først i 1890 i England ved Burnham-on-Crouch ved Thames-Bugten[2]). Senere har man kunnet spore dens Frem-

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[1]) *Osc. Nordqvist:* **Bidrag till kännedomen om Bottniska vikens och norre Östersjöns evertebratfauna. Meddel. af Soc. pro Fauna et Flora Fennica 17. 1890.**

[2]) *A. S. Kennard:* **On the Distributions of Petricola pholadiformis Lam. Proc. Mal. Soc. London. Vol. VIII S. 3. 1908.**

trængen videre ind i Nordsøen. Den er angivet fra Belgien af Dupuis & Putzeys, og i 1906 er den fundet af E. Wolf ved de Øst-Friesiske Øer og af C. Boettger ved de Nord-Friesiske Øer, bl. a. ved Sylt[1]). Det er derfor heller ikke saa overraskende, at den nu er trængt frem ogsaa til de danske Kyster.

Dr. *Mortensen* mente ikke, der var noget Bevis for, at de Forhold, hvorunder de nævnte Arter lever paa Vaderne, virkelig var Grunden til, at de kunde taale Brakvand; det kunde lige saa vel — eller snarere — være en medfødt Egenskab hos dem. Docent *Stamm* spurgte, om der var foretaget direkte Maalinger af Vandets Saltholdighed paa Vaderne. Foredragsholderen erklærede, at skønt der ikke var foretaget direkte Maalinger, tvivlede han ikke om, at Vandet dér kunde være saa godt som fersk under Regnskyl. Mag. *Bardenfleth* spurgte, om det ikke kunde være muligt, at Muslingerne helt kunde lukke sig i den Tid, der kunde være Ferskvand over dem (højst 6 Timer). Foredragsholderen turde ikke benægte dette. Cand. *P. Krarup* mente, at det, at en isoleret Koloni af disse Dyr blev tvungne til at udholde Ferskvand, ikke kunde have nogen Forbindelse med Artens Optræden i Østersøen, da man saa maatte antage, at det skulde være Unger af netop disse Individer, der vandrede Skagen rundt derind. Paa en Forespørgsel af Cand. *Fr. Johansen* meddelte Foredragsholderen, at hvor Vandets Saltholdighed er hyppige og stærke Vexlinger underkastet, bliver Molluskfaunaen fattig. I Nymindestrømmen, f. Ex., hvor Vandets Saltholdighed førend Dannelsen af det nye Udløb ved Hvide Sande varierede fra ca. 4 ‰ til ca. 33 ‰, fandtes kun ganske enkelte Molluskarter. De fleste Saltvandsarter, der som Larver førtes ind i Strømmen ude fra Havet, dræbtes af det udstrømmende svagt saltholdige Vand, medens Ferskvandsarternes Udbredelse hindredes af det indstrømmende Vand af høj Saltholdighed. I Nymindestrømmen fandtes dengang kun 7 Molluskarter: Mytilus edulis, Cardium edule, Macoma baltica, Scrobicularia plana, Mya arenaria, Paludestrina stagnalis og Paludestrina ventrosa, altsaa de samme Muslinger og et Par af de samme Sneglearter, som er karakteristiske for Vaderne ved Graadyb og Fanø. — Dr. *V. Nordmann* spurgte, om Foredragsholderen havde fundet Donax vittatus levende i Graadyb. F. meddelte, at han ikke havde fundet den levende dér, men derimod længere mod Nord ved Jyllands Vestkyst.

Inspektor *W. Lundbeck* foreviste nogle Insektgnav (af Træbukke) i Bly (Hylotrupes bajulus L.). Dr. *J. C. Nielsen* foreviste Larver af Daadyrets Svælgbræmse (Cephenomyia), ny for dansk Fauna. Insp. *Lundbeck* gjorde opmærksom paa, i Anledning af Foredragsholderens Ytring, at „Bræmser" ikke længere repræsen-

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[1]) *Caesar Boettger:* Petricola pholadiformis Lam. im deutschen Wattenmeer. Zool. Anzeiger. XXXI Bd. 1907.

terede nogen systematisk Enhed, at disse Dyr dog staar hinanden nær. Pater *Breitung* foreviste Larver af Rensdyrets og Kamelens Næse-Bræmser. — Professor *V. A. Poulsen* foreviste et nyt Mikrometer. Docent *Stamm* Antennularia, ny for dansk Fauna. Dr. *Th. Mortensen* refererede nogle nyere Forsøg med kunstig Befrugtning af Echinoderm-Æg, „en til Ceylon indført Snegl" (Achatina), samt foreviste nogle Expl. af et Søpindsvin (Colobocentrotus) fra Java.

Den 28. April. Cand. *Fr. Johansen* holdt Foredrag om Ferskvands-Dyreliv i Nordøst-Grønland. (Se Afhandl „Freshwater-life in North East Greenland". Medd. om Grønland, Bd. 45, 1911). Dr. *Mortensen* bemærkede, at det var underligt, om Apus glacilis virkelig skulde afsætte sine Æg paa Mos, da den dog normalt gaar med dem i Rugepose; Foredragsholderen erkendte, at han ikke havde klækket disse Æg, men mente dog ikke, at der kunde være Tvivl om, at det virkelig var Apus-Æg.

Den 17. Januar foreviste Journalist *J. Ervø* i Studenterforeningens Festsal for Naturhistorisk Forening, Dansk Botanisk Forening, Dansk Geologisk Forening og Dansk Ornithologisk Forening (Medlemmer med Damer) en ny Række af *Schilling's* Lysbilleder af Natur og Dyreliv i Afrika.

Den 11. April holdt Cand. mag. *Ad. S. Jensen* Foredrag (for Medlemmer med Gæster, i Studenterforeningens Bygning): „Med „Tjalfe" fra Umanak til Cap Farvel".

Beretning om de i Sommeren 1911 af Naturhistorisk Forening foretagne Excursioner.

Søndag den 14. Maj. Ornithologisk Excursion til Lyngby Skov ved Arresø, sammen med Dansk Ornithologisk Forening. Leder Hr. *S. Saxtorph.*

Fra Ølsted Station spadseredes til Lyngby Skov, hvor man besøgte en Hejrekoloni paa henved 50 Par; fra Rederne blev nogle Hejreunger hentet ned og beset og derpaa atter anbragt i Rederne. Efter at man havde spist Frokost i Skoven spadseredes rundt om denne og videre forbi Arresø, i hvilken nogle Graagæs og Lappedykkere saas, til Kregome, hvor Hr. Gaardejer *Anders Hansen* gæstfrit havde indbudt Deltagerne til at nyde en Forfriskning. Sluttelig vandrede man til nogle Udsigtspunkter ved Roskilde Fjord, hvorefter man fra Kregome Station kørte tilbage. Følgende 47 Arter iagttoges:

Anas boscas, Anser cinereus, Perdix cinerea, Podicipes cristatus, Vanellus cristatus, Gallinago scolopacina, Larus ridibundus, Larus

canus, Sterna hirundo, Ardea cinerea, Ciconia alba, Falco tinnunculus, Columba palumbus, Cuculus canorus, Dendrocopus sp., Pica caudata, Corvus monedula, Corvus cornix, Hirundo riparia, Hirundo rustica, Sitta europœa, Alauda arvensis, Sturnus vulgaris, Troglodytes parvulus, Accentor modularis, Parus major, Parus coeruleus, Parus palustris, Sylvia curruca, Sylvia hortensis, Acrocephalus phragmitis, Phyllopseustes trochilus, Motacilla flava, Motacilla alba, Turdus merula, Praticola rubetra, Ruticilla phoenicura, Erithacus rubecula, Passer domesticus. Passer montanus, Fringilla coelebs, Carduelis elegans, Ligurinus chloris, Cannabina linota, Emberiza schoeniclus, Emberiza citrinella, Emberiza miliaria.

A. C.

Søndag den 28. Maj var Naturh. Forening af Direktør *Heilbuth* indbudt til, sammen med Ornithologisk Forening, at aflægge et Besøg paa Øen Egholm i Storebælt.

Fra Korsør sejlede man i et lille Dampskib over til Egholm, og iagttog under Vejs bl. a. et Træk af *Cypselus apus*. Ved Landgangen paa Egholm blev Deltagerne budt velkommen af Dir. *Heilbuth*. Angaaende selve Øen henvises til den i Bindet for 1909, p. VIII, givne Beskrivelse. Man genfandt de mægtige Skarer af ynglende Storm- og Hættemaager, som fandtes ved Foreningernes forrige Besøg paa Egholm, i uformindsket Tal, og disse to Maagearter dominerede fuldstændig Øens Fugleliv. Af den store Havmaage fandtes nogle faa Par. Under Opholdet paa Øen iagttoges et Træk af Hvepsevaager. Efter at man havde spadseret rundt paa Øen og nydt dens herlige Natur og rige Fugleliv, spiste man til Middag hos Hr. og Fru Heilbuth, som med storartet Gæstfrihed havde indbudt den store Forsamling hertil. — Følgende 42 Arter iagttoges:

Tadorna cornuta, Somateria mollissima, Mergus serrator, Phasianus colchicus, Vanellus cristatus, Hæmatopus ostreologus, Larus ridibundus, Larus canus, Larus argentatus, Pernis apivorus, Syrnium aluco?, Columba palumbus, Corvus monedula, Corvus cornix, Hirundo rustica, Hirundo urbica, Alauda arvensis, Sturnus vulgaris, Troglodytes parvulus, Accentor modularis, Parus major, Sylvia curruca, Sylvia cinerea, Sylvia hortensis, Acrocephalus palustris, Phyllopseustes trochilus, Phyllopseustes sibilatrix, Hypolais icterina, Luscínia philomela, Motacilla flava, Turdus merula, Turdus musicus, Saxicola oenanthe, Muscicapa grisola, Lanius collyrio, Cypselus apus, Passer domesticus, Fringilla coelebs, Ligurinus chloris, Cannabina linota, Emberiza citrinella, Emberiza miliaria.

Reder med Æg eller Unger fandes af følgende 8 Arter: *Tadorna cornuta, Phasianus colchicus, Larus ridibundus, Larus canus, Larus argentatus, Sturnus vulgaris, Turdus merula, Turdus musicus.*

Reder under Bygning fandtes af *Luscinia philomela* og *Sylvia hortensis.*

A. C.

En Excursion til Gurresø, som var ansat til Søndag d. 1. Oktober, maatte opgives paa Grund af daarligt Vejr. De faa Deltagere, der havde

trodset Vejret, blev af Dr. *Wesenberg-Lund*, som skulde have ledet Excursionen, indbudte til at bese den Ferskvands-biologiske Stations Laboratorium og Samlinger.

Den Schibbyeske Præmie.

Præmien for Aaret 1911 tildeltes Mag. sc. *Henning E. Petersen* for hans Arbejde: „Danske Arter af Slægten Ceramium Lyngbye". (Vid. Selsk. Skr. 7. R. Bd. V. 1908).

Undersøgelser over entoparasitiske Muscidelarver hos Arthropoder.

Af

Dr. ***J. C. Nielsen.***

Carcelia gnava Meig[1]).

Udvikling.

Ægget. Æggeskallen (Textfig. 1 og 2) er aflang, c. 0,75—1 mm. lang, tilspidset i begge Poler, meget tynd og gennemsigtig. Overfladen er afdelt i en stor Mængde Felter, der undertiden, særlig omkring Æggets Midte, er regelmæssig sekskantede. Æggeskallens ene Pol løber ud i en traadformet Forlængelse, hvis Spids indsænkes i en gennemsigtig Klump af et Kirtelsekret, som Fluen afsondrer ved Æglægningen og anbringer paa det Sted, hvor Ægget skal afsættes.

I de fleste Æg, man træffer afsatte paa Værtlarverne, er Embryonet vidt fremme i sin Udvikling, men jeg har et Par Gange fundet Værtlarver med Æg, hvori Embryonerne var ganske uudviklede, saa at der ikke var Spor til Segmentering, ligesom Svælgskelettet og Trachéerne heller ikke kunde iagttages. Det er derfor sandsynligt, at Æglægningen foregaar paa et Tidspunkt, hvor Udviklingen endnu er temmelig langt tilbage.

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[1]) Denne og de følgende Arter er bestemte af H. Kramer i Niederoderwitz og Dr. Villeneuve i Rambouillet. Den sidstnævnte har ydet mig stor Hjælp ved Adskillelsen af *Carcelia*-Arterne, og efter en Undersøgelse af alle af mig klækkede Carcelier har han meddelt mig, at den Flue, som jeg i en tidligere Afhandling (Iagttagelser over entoparasitiske Muscidelarver hos Arthropoder, Kbhvn. 1909 p. 56) har opført som *Carcelia gnava* B. & B. ikke er denne Art, men derimod *C. comata* Rond.

Æg af den ovenfor beskrevne Form er tidligere omtalt af Townsend[1]) og Pantel[2]) som forekommende hos *Carcelia chelonia* Rond. Ifølge Meddelelse fra Dr. J. Villeneuve, som har haft Pantels Eksemplarer til Undersøgelse, er denne Forfatters Art identisk med *C. comata* Rond., hvis Udvikling jeg, som før omtalt, har beskrevet under Navnet *C. gnava*. Jeg kan tilføje, at de Æg, jeg tidligere beskrev som *C. gnava's*, ikke tilhører denne Art, men en ubestemt Art, der lagde Æg paa Værter, der alle-

Fig. 1.

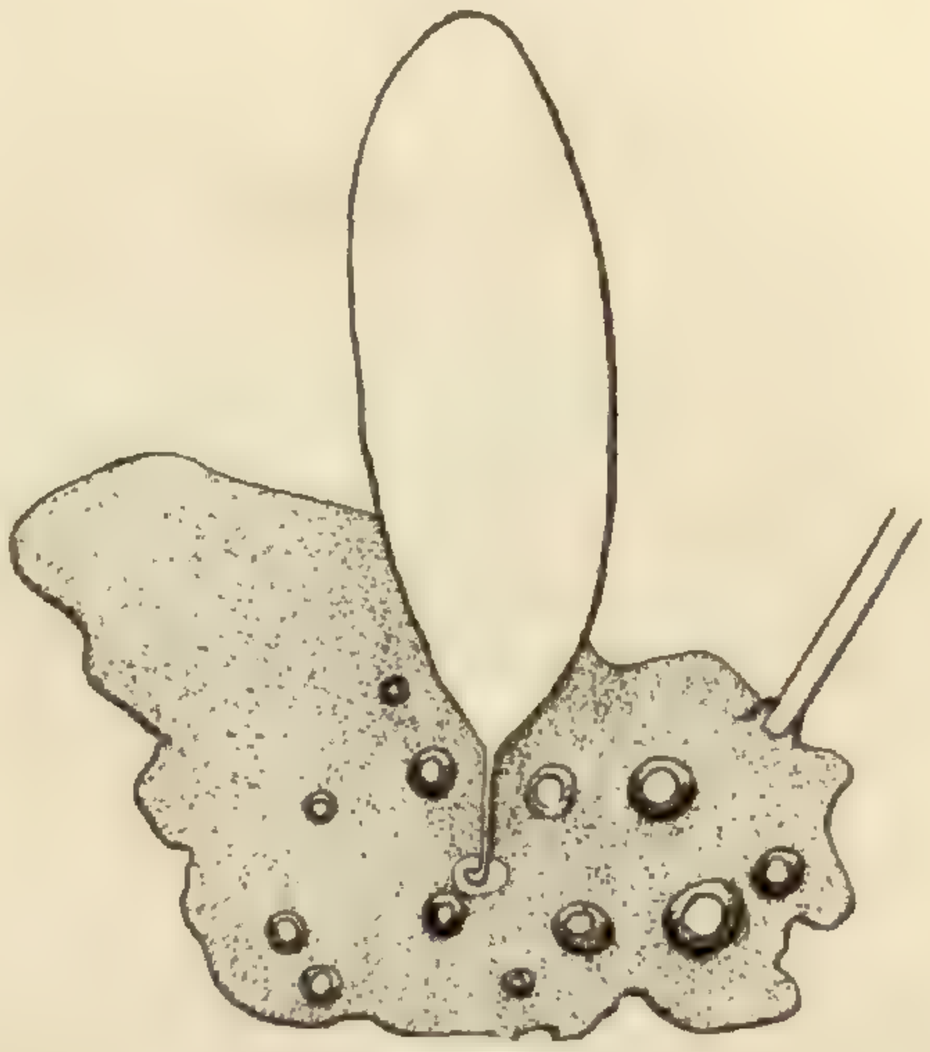

Fig. 2.

Æg af *Carcelia gnava*; Fig. 1. paa et Haar.
Fig. 2. paa Huden af Larven til *Stilpnotia salicis*. $^{55}/_{1}$.

rede var inficerede med *Carcelia comata's* Larver. Det er senere lykkedes mig at finde de tomme stilkede Æggeskaller af *C. comata* paa de Værter, hvoraf jeg klækkede Snylteren.

Larven i 1ste Stadium. Længde c. 0.5—0.75 mm. 2—11. Leds Forrande og 9—11. Leds Bagrande med Tornbælter, der paa 9—10. Leds Bagrande dog kun findes paa Larvens Underside. Midt paa 11te Led findes et bredt og uregelmæssigt Tornbælte. Tornene

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[1]) Townsend: A record of results from rearings and dissections of Tachinidæ (U. S. depart. of agriculture. Technical series No. 12. Part VI. 1908 p. 97).

[2]) Pantel: Recherches sur les diptères à larves entomobies I. (La cellule XXVI 1910 p. 98).

er stillede uregelmæssig imellem hverandre og deres Størrelse er stærkt varierende. Svælgskelettets Spids er comprimeret, temmelig stump og fortil bøjet. Svælgskelettet er paa Midten udvidet og her for neden indbugtet; Svælgpladerne omtrent lige lange, de øvre bagtil afrundede, de nedre afstudsede (Pl. I Fig. 1) Bagspiraklernes Atrium er meget langstrakt, den yderste Trediedel opadbøjet, endende med 2 meget smaa Knopper.

2det Stadium. Længde 2—3 mm. Forranden af 2—10. Led med regelmæssige Tornbælter, der aftager i Størrelse bagud og paa 6—10. Led er indskrænkede til Undersiden; 4—11. Leds Bagrande med Bælter, der paa 4—10. Led kun findes paa Undersiden; 12. Led paa Midten med et Bælte. Mundkrogenes Rod er for- og bagtil udtrukket i Tænder, af hvilke den forreste er fremad- og den bageste bagudrettet. Spidsen er slank og kun svagt krummet. Svælgskelettet er fortil smalt; omtrent ved Forbindelsesstykket imellem Svælgskelettets 2 Halvdele findes paa de øvre Svælgpladers Rand et stumpt Fremspring. De øvre Svælgplader er brede og jævnt afrundede, de nedre lidt kortere og bagtil indbugtede (Pl. I Fig. 2) Forspiraklernes Atrium er langstrakt, tenformet med 3 eller 4 korte Knopper, der er stillede i en lige Linie. Hos den samme Larve kan der i det ene Forspirakel findes 3, i det andet 4 Knopper (Tekstfig. 3). Bagspiraklernes Atrium ender med 2 dybt adskilte langstrakte Knopper.

3die Stadium. Længde 9—14 mm. 2—11. Leds Forrande, 8—10. Leds Bagrande og hele 11te Leds Bagrand paa Undersiden med Tornbælter, 12. Led paa Midten med et Bælte. Mundkrogenes Rod bærer fortil en i Spidsen indbugtet Knude og bagtil en afrundet Tap. Paa Inderranden findes en lille Tand. Krogenes Spids er bred og svagt krummet. De forreste Svælgplader er fortil smalle, vider sig derefter ud og er bagtil mere end dobbelt saa brede som fortil. De øvre Svælgplader naar fortil med en bred Forlængelse frem til Midten af de forreste Svælgplader; bagtil er de jævnt afrundede og ubetydelig længere end de nedre (Pl. I Fig. 3) Forspiraklernes Atrium er kort og plumpt, lidt længere end bredt,

smallere fortil end bagtil og fortil kileformet tilspidset. Det ender med 3 eller 4 smaa Knopper, Antallet kan ligesom i 2det Stadium variere i den samme Larves 2 Forspirakler (Tekstfig. 4) Bagspiraklernes Ramme er sort og udsender 2 Broer, hvoraf den ene er bred og gaffeldelt, den anden smal og udelt. Broerne er sorte ved Roden, lysere udadtil. — Aandefelterne er langstrakte og lige, det midterste kortest (Textfig. 5.) Gataabningen er skudt frem til 12te Leds Forrand, den omgives af 2 smaa halvmaaneformede, lyse, brunlige Kitinplader.

Fig. 3.

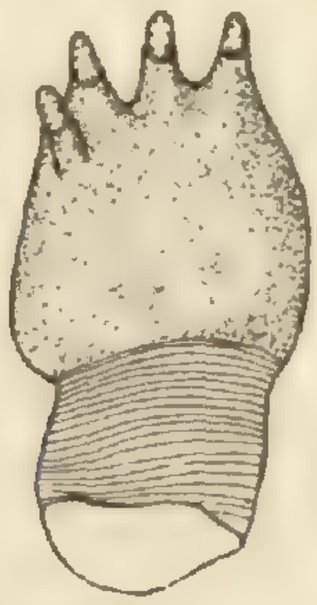

Fig. 4.

Tøndepuppen. Længde 5.5—8 mm. Bredde 3—4 mm. Formen varierende, Forenden i Reglen noget bredere end Bagenden, og Undersiden noget fladere end Rygsiden. Ledgrænserne tydelige, men ikke indskaarne. Overfladen fint tværrynket eller ridset. Hverken For- og Bagspiraklerne eller Gattet fremstaaende. De ydre Puppespirakler findes som ganske svage, runde Forhøjninger ved Roden af 5te Led.

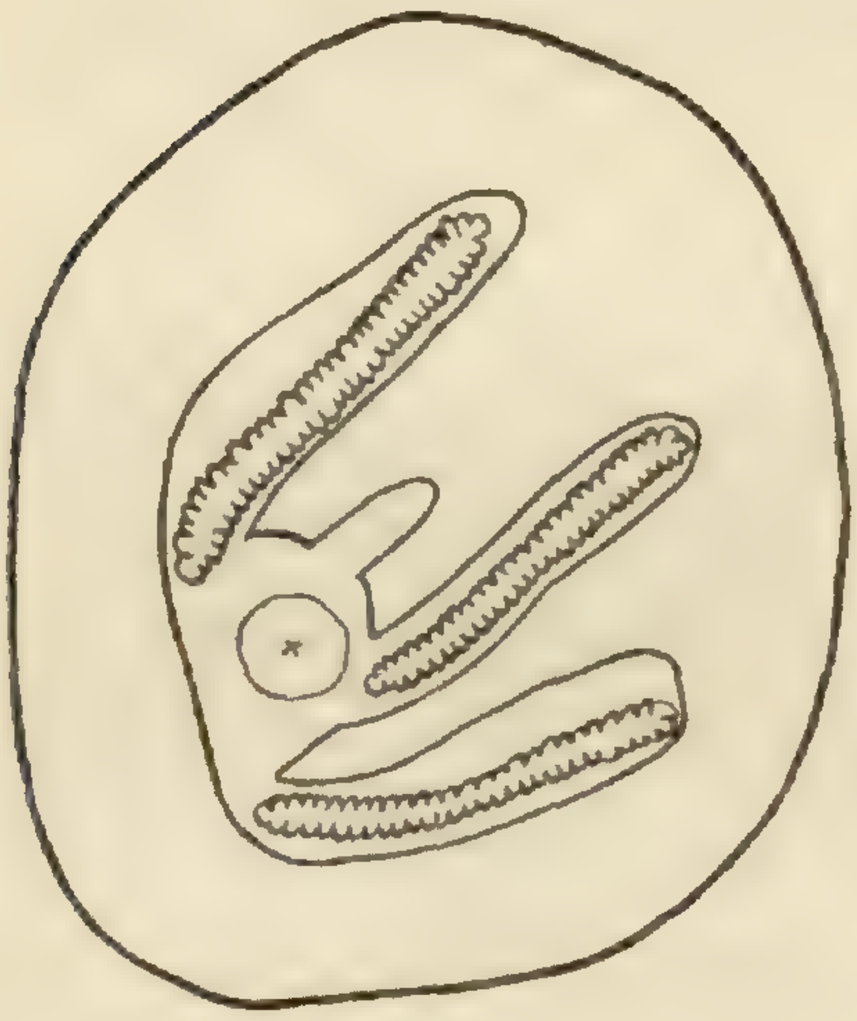

Fig. 5.

Carcelia gnava. Fig. 3. 2' Stadiums Forspirakel $^{265}/_{1}$. Fig. 4. 3' Stadiums Forspirakel $^{100}/_{1}$. Fig. 5. 3' Stadiums Bagspirakel $^{45}/_{1}$.

Biologi.

Carcelia gnava Meig. er tidligere klækket af forskellige Spinderarters Larver (*Malacosoma neustria* L., *Stilpnotia salicis* L. og *Orgyia antiqua* L.). Jeg har iagttaget den ved Tisvilde, hvor den snyltede hos de 2 førstnævnte Arter, og har her haft Lejlighed til gennem flere Aar at følge dens Optræden og dens Indvirkning paa et Larveangreb.

Paa et Pilehegn optraadte i Juli og August 1905 et meget

stort Antal Sommerfuglelarver, tilhørende mange forskellige Arter (*Cerura vinula* L. *Smerinthus populi* L. *S. ocellata* L. *Notodonta zigzac* L., *Malacosoma neustria* L. o. m. a.), ligesom der fløj en Del Imagines af *Stilpnotia salicis* omkring og lagde Æg paa Pilene. Den sidstnævnte Arts Larver kommer ud af Æggene om Efteraaret, overvintrer, æder Pilebladene i Maj—Juni og forpupper sig i Slutningen af sidstnævnte Maaned. Sommerfuglen er meget almindelig her i Landet, og findes i de fleste Pileplantninger. I 1905 optraadte den ikke i paafaldende stort Antal paa Pilehegnet, men i de følgende Aar formerede den sig saa stærkt, at dens Larve i 1907 ganske afløvede Pilene. Jeg fandt i Begyndelsen af Juli en Del fuldt udviklede Spindere, der var i Færd med Æglægningen, og Pupper, der ikke — som under normale Forhold — var ophængte enkeltvis i sammenspundne Blade eller mellem Kviste og Blade, men som fandtes samlede i store Klumper i løse Spind imellem Grene eller i Grenvinkler. Paa Pilene krøb desuden et stort Antal fuldvoksne Larver og mange mindre, ikke en Gang halvvoksne, uden at kunne finde Næring. Hist og her saas tillige døde Larver paa Jorden. Aarsagen til Spinderens stærke Formering var tydelig nok den, at Larverne næsten ikke var angrebne af Snyltere. Jeg foretog Klækninger med et temmelig stort Antal Larver og Pupper og klækkede ingen Snyltehvepse, men et enkelt Eksemplar af *Carcelia gnava*. I 1908, i hvilket Aar jeg ikke selv saa Pilehegnet, var efter andres Sigende Angrebet taget af, men der var dog endnu flere helt afløvede Partier. Næste Aar, 1909, besøgte jeg atter Hegnet og fandt, at Larvernes Antal var betydelig mindre end i 1907, og at Hegnet var grønt. Ved Prøver, der udtoges paa forskellige Steder af Hegnet, viste det sig, at lidt over 50 % af Spinderlarverne var inficerede med Snyltefluens Larver, nemlig i den sydlige Del 59 %, i Midten 66 % og ved den nordlige Ende 47 %.

I Juli 1910 var Angrebet ganske ophørt. Der fandtes paa hele Hegnet kun et ganske forsvindende Antal Spinderlarver. Efter det betydelige Procentantal af Larver, der var inficerede det forrige

Aar, var det rimeligt at vente en stærk Nedgang i 1910; men denne forekom mig for stærk til, at den alene kunde skyldes Snylterens Virksomhed i 1909. Jeg undersøgte derfor Pilene nøjere og fandt her Sporene af Snylterens Optræden i 1910, idet der omkring paa Stammerne og Grenene fandtes en Del tomme Larvehude af yngre eller halvvoksne Værtlarver, af hvilke Snylterne allerede var gaaet ud. Saaledes havde Snylterne nu faaet Bugt med Angrebet ved at tilintetgøre Resten af Larvebestanden paa et saa tidligt Tidspunkt, at saa godt som ingen af Spinderlarverne naaede fuld Størrelse. Det er utvivlsomt, at den stærke Nedgang i Spindernes Antal skyldes Snyltefluen; men det bør dog anføres, at der sammen med denne i 1909 optraadte en Snyltehveps, der dog kun spillede en ganske forsvindende Rolle, og at der i nogle Spinderlarver fandtes Larver af *Sarcophaga affinis* Fall.

I en Pileplantning, der laa i nogen Afstand fra det ovenfor omtalte Hegn, fandtes en Del Larver af *Malacosoma neustria*, af hvilke en Del var inficerede med Larver af *Carcelia gnava*.

Snyltefluen afsætter i Reglen sine Æg paa Haarene af *Stilpnotia*-Larven (Textfig. 1), sjældnere paa dens Hud (Textfig. 2); hos Ringspinderlarven, der er svagere behaaret, findes Æggene derimod hyppigere paa Huden. Begge Arters Larver træffes undertiden med Æg paa Panden eller andetsteds paa Hovedet; en Gang har jeg fundet et Æg fæstet til et Spirakel. Da Æggets Stilk er stiv, og Ægget, medens Larven endnu ikke er krøbet ud, rager frem, er dette ikke vanskeligt at finde paa Værterne, derimod kan de tomme, sammenfaldne Æggeskaller være vanskelige nok at opdage efter Larvens Fremkomst.

I denne Forbindelse kan anføres, at jeg har fundet Æg af en anden Snylteflue paa Haarene af Larven til *Acronycta menyanthides* View. Disse Æg (Textfig. 6) var c. 0,5 mm. lange og 0,25 mm. brede, ustilkede, tykskallede, stærkt hvælvede paa Oversiden og flade paa Undersiden, langs hvilken de var fastklæbede til Værtlarvens Haar. I et af Æggene fandt jeg en fuldstændig udviklet Larve, hvis Svælgskelet viste den mest slaaende Overensstemmelse

med *Carcelia gnava* Larvens (Textfig. 7). Da *Acronycta*-Larven forpuppede sig, før Snylterne var krøbne ud af Æggene, var der ikke Lejlighed til at klække Fluen.

Carcelia gnava-Larven aabner Æggeskallen fortil og kryber ud; den bevæger sig omkring udenpaa Værtens Legeme, indtil den finder et Sted, hvor Indboringen kan finde Sted. En Snyltelarve, hvis Indboring jeg fulgte under Lupen, trængte ind igennem et Hul midt paa et af Værtens Rygled. Efterat Snylteren er kommen ind i Værtens Legeme vandrer den frit om; men samtidig med, at den gaar over i 2det Stadium, hæfter den sig fast til Værtens Hudskelet ved en Tragt, der i Reglen udgaar fra en Ledhud; Tragten fortsættes af en Sæk, og begge disse Deles Bygning svarer ganske til de tidligere beskrevne hos *Ptychomyia selecta* Meig. Snylteren forbliver fasthæftet til Tragten, indtil den er fuldvoksen, og ernærer sig først af Værtens Fedtvæv og senere af dens øvrige Organer.

Fig. 6.

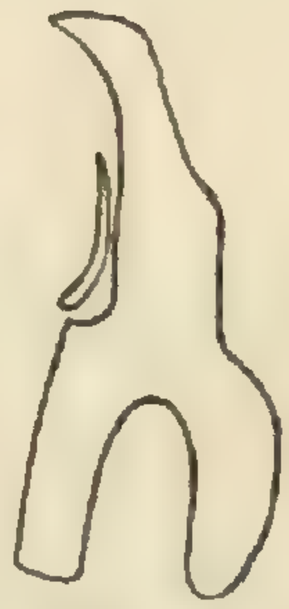

Fig. 7.

Fig. 6. Snylteflueæg paa et Haar af Larven til *Acronycta menyanthides* $^{20}/_{1}$.
Fig. 7. Svælgskelet af en Larve der fandtes i et saadant Æg. $^{93}/_{1}$.

Med Hensyn til de Alderstrin, paa hvilke Værtlarverne angribes, viste der sig en Forskel imellem *Stilpnotia* og *Malacosoma* Larverne. De førstnævnte inficeres paa alle Alderstrin, ligefra ganske smaa til fuldvoksne. Efter Værtens Størrelse udvikles der i dem fra én til fire Snyltere. Inficerede Larver, der endnu ikke har gennemgaaet sidste Hudskifte, fæster sig, kort forinden de dræbes af Snylteren, med Gangvorterne fast til et Blad eller en Gren og hænger slapt ned; de tømte og indtørrede Larvehude, paa hvilke de Gangvorter, der er fæstede til Underlaget, er stærkt udtrukne, forbliver siddende her efter Snylterens Udboring (Textfig. 8). De voksne inficerede Larver, der let kendes paa, at deres Pletters normale hvide Farve er forandret til gul, begynder at ind-

spinde sig i et løst og uregelmæssigt Spind; Forpupningen begynder, idet Larvehuden revner fortil, og Puppen trækker sig ud af Larvehudens sidste Led; længere naar Forpupningen i Reglen ikke, da Snylteren paa dette Tidspunkt hidfører Værtens Død. Disse inficerede Pupper har et meget karakteristisk og let kendeligt Udseende.

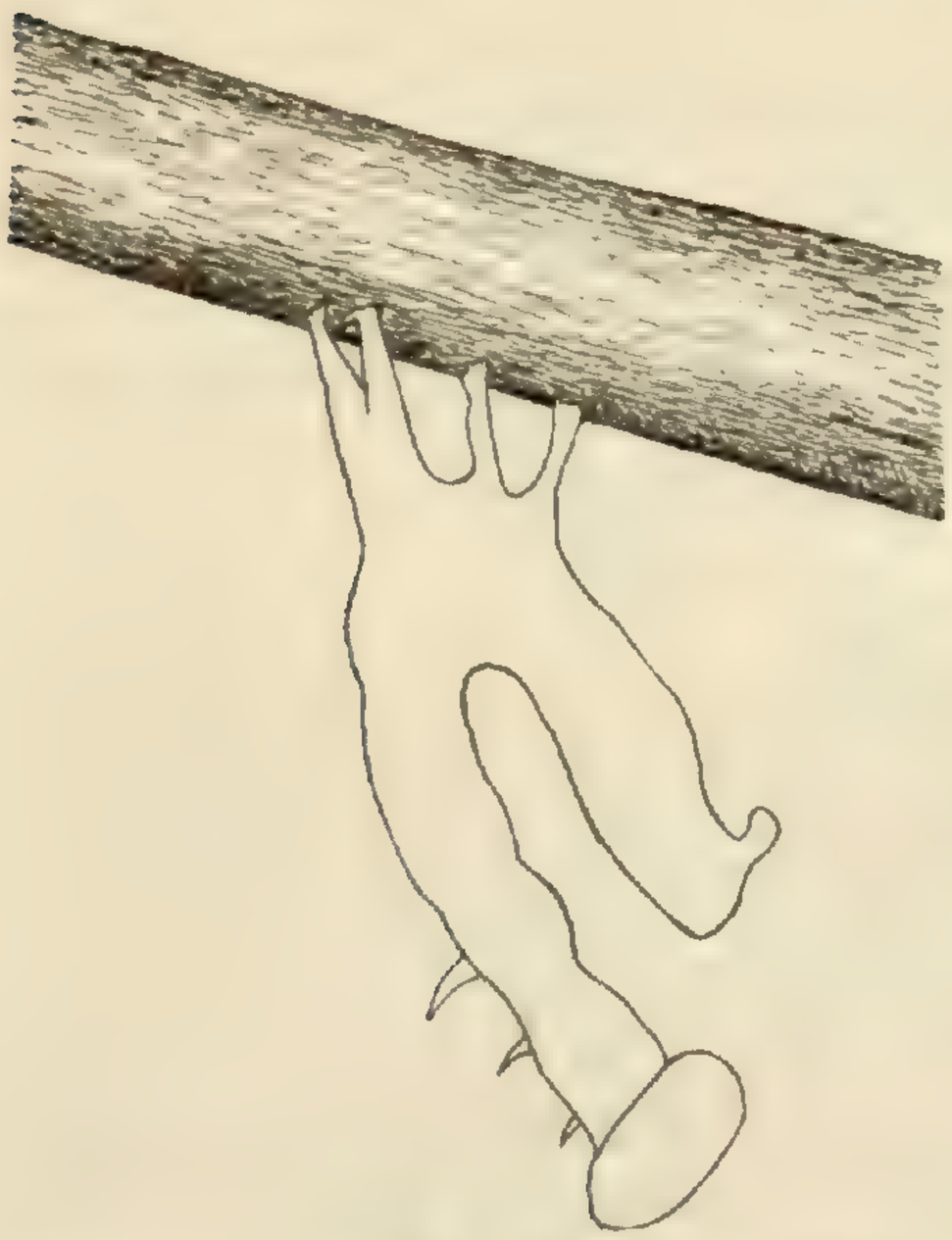

Fig. 8.
En yngre Larve af *Stilpnotia salicis*, efter at *Carcelia*-Larven har boret sig ud. $^{3}/_{1}$.

I sjældnere Tilfælde har jeg fundet Snylteren i fuldt udviklede *Stilpnotia*-Pupper. — Hos *Malacosoma* har jeg kun truffet Snylteren hos fuldvoksne Larver, trods det, at der paa de samme Piletræer, hvor disse levede, fandtes talrige ikke fuldvoksne Larver. Hos denne Art sker det hyppigere end hos *Stilpnotia*-Laverne, at Snylteren gaar over i Puppen.

De fuldvoksne Snyltelarver borer sig ud af Værten og forpupper sig i Jorden; i sjældnere Tilfælde sker dog Forpupningen i Værtens Hud. Puppetiden er kortvarig. En Del Larver forpuppede sig i Dagene fra $^{9}/_{7}$ til $^{15}/_{7}$, og Fluerne kom frem fra $^{25}/_{7}$ til $^{3}/_{8}$ s. A.

Exorista blepharipoda B. & B.

Udvikling.

Larven i 1ste Stadium. Jeg har kun haft et Par afkastede Larvehude til Beskrivelse, og da de var stærkt sammenkrøllede og beskadigede, kan jeg ikke angive Tornbælternes Fordeling; det kunde dog iagttages, at Bælterne var meget brede, og at Tornene var stillede uregelmæssig imellem hverandre. Svælgskelettets forreste Parti er langstrakt, noget udvidet fortil og her bøjet i en næsten ret Vinkel; bagtil findes et langstrakt, lystfarvet

Felt; de øvre Svælgplader er brede, de nedre smalle og saa korte, at de ikke naar tilbage til Midten af de øvre (Pl. I Fig. 4.) Bagspiraklernes Filtkamre er temmelig korte og brede, med svagt bøjede Knopper.

2det Stadium. Længde 2—3 mm. 2—6. Leds Forrande med brede og de følgende Leds med smallere Bælter; de sidste Leds Bagrande med brede Bælter. 12. Led helt besat med Torne. Mundkrogene er plumpe, Roden er for- og bagtil udtrukken i tornformede Spidser. Spidsen er svagt bøjet, fortil udtrukket i et Antal spidse Tænder. Svælgskelettets forreste Del er fortil tilspidset, de øvre Svælgplader i Reglen fortil udtrukket i en tilspidset Forlængelse; de nedre Plader er ligesaa lange som de øvre, med indbugtet Bagrand (Pl. I Fig. 5). Paa hver Side af Mundaabningen findes i Huden nogle smaa udadrettede Torne, og imellem disse et Antal mørke Punkter (a). Forspiraklerne er kølleformede og ender med 2 dybt adskilte Knopper. Bagspiraklerne er ligeledes kølleformede og ender med 2 dybt adskilte, langstrakte og bøjede Knopper.

3die Stadium. Længde 12—15 mm. 2—6. Leds Forrande med Tornbælter, der gaar helt omkring Leddene, og 7—11. Leds Forrande med Bælter paa Undersiden, 7. Led har dog undertiden Spor til et Bælte paa Rygsiden. 6—8. Leds Bagrand paa Undersiden og hele 9—11. Leds Bagrande med Bælter; 12. Led besat med Torne, undtagen umiddelbart bagved Gataabningen.

Mundkrogenes Rod løber fortil ud i en i Spidsen kløftet Forlængelse og bagtil i en meget smallere, bagudrettet, noget krummet Torn. Mundkrogenes Spids er slank. Paa Inderranden findes et svagt tandformet Fremspring, og omtrent overfor dette paa Rygsiden et mindre Fremspring. De forreste Svælgplader er bredere bagtil end fortil; Forbindelsesstykket findes umiddelbart foran Roden; de øvre Svælgplader er brede. jævnt afrundede; fortil strækker en smal Forlængelse sig op i Højde med Midten af de forreste Svælgpladers. De nedre Svælgplader er ubetydelig længere end de øvre (Pl. I Fig. 6). Ligesom i forrige Stadium findes der et Parti Torne paa hver Side af Mundaabningen; disse sidder paa et af-

rundet stærkere kitiniseret Felt, der passer ind i Vinklen imellem Mundkrogens Spids og Rodens forreste Udvækst (a). Ialt findes der 7—12 udad- og nedadrettede, temmelig plumpe og i Spidsen mørkt kitiniserede Torne; spredt over hele Feltet findes desuden en Del meget smaa Prikker (Textfig. 9).

Fig. 9. *Exorista blephariphoda.* 3. Stadium Torngruppe fra Mundaabningens Side. $^{220}/_{1}$.

Forspiraklernes Atrium er delt i to Partier; det indre er bredere end Trachéen og afrundet; det ydre Parti bestaar af 2 Grene, der udgaar fra den indre Del og som er forbundne med hinanden ved Tværgrene; fortil findes flere mindre Grene, der hver ender med en Knop, der er aflang-oval og noget bredere end Grenen. Knoppernes Antal er c. 10—12, og de er i Reglen stillede i 2 paralelle Rækker (Textfig. 10).

Bagspiraklerne er temmelig tæt sammenstillede, ikke hvælvede, noget længere end brede; Kitinrammen er bred og udsender indad en Bro, der omslutter Trachéaabningen. Fra denne Bro udgaar atter 2 Broer over til Rammens modsatte Side; herved deles Spiraklet i 3 Partier, der hver bærer et slynget Aandefelt, af hvilke et af de ydre i Reglen er brudt i 2 Stykker (Tab. I Fig. 7). Gataabningen har Form som en lille oval Plade og findes skudt frem til 11te Leds Bagrand.

Fig. 10. *Exorista blepharipoda* 3. Stadium. Forspirakel. $^{60}/_{1}$.

Tøndepuppen er fra 4—9 mm. lang og fra $2^{1}/_{2}$—4 mm. bred, større Exemplarer sorte, mindre brune, stærkere hvælvet paa Rygsiden end paa Bugsiden og Forenden noget smallere end Bagenden. Ledgrænserne tydelige, Overfladen fint og aabent tværfuret. Langs Siderne findes en noget bugtet Linie af fine Punkter. Forspiraklerne er ikke fremtrædende og Bagspiraklerne kun svagt. De ydre Puppespirakler mangler.

Biologi.

Exorista blepharipoda's Vært har hidtil ikke været kendt. Jeg har fundet den hos 2 *Acronycta* Arters Larver. (*A. psi* L. og

A. tridens Schiff.) Disse Larver er fuldvoksne i September, og paa denne Tid indsamledes ved Valby i 1908—1909 en halv Snes inficerede Larver. Der var ikke ydre Mærker paa Sommerfuglelarverne, der viste, at de var angrebne, og Snylterne opdagedes først, da de som fuldvoksne krøb ud af deres Værter. Hver Sommerfuglelarve indeholdt fra 2—7 levende Snyltere i 3die Stadium, og desuden fandtes hyppig enkelte i samme Stadium, der var pressede ihjel af de andre. Igennem Huden af en Værtlarve, der conserveredes kort forinden Snylterne skulde til at bore sig ud, men som endnu var i Live, kunde Bagenden af en Snyltelarve, der var i Færd med at bore sit Udgangshul, skimtes. Tarmkanalen var stærkt sammenpresset og helt tom, og Værten udfyldtes af 3 *Exorista*-Larver, paa hvilke der sad Flige af sammenpresset og destrueret Fedtvæv. Dette pilledes forsigtigt af og undersøgtes nærmere, og herved lykkedes det at finde velbevarede Larvehude af 2det Stadium og Dele af 1ste Stadiums med vedhængende Svælgskeletter.

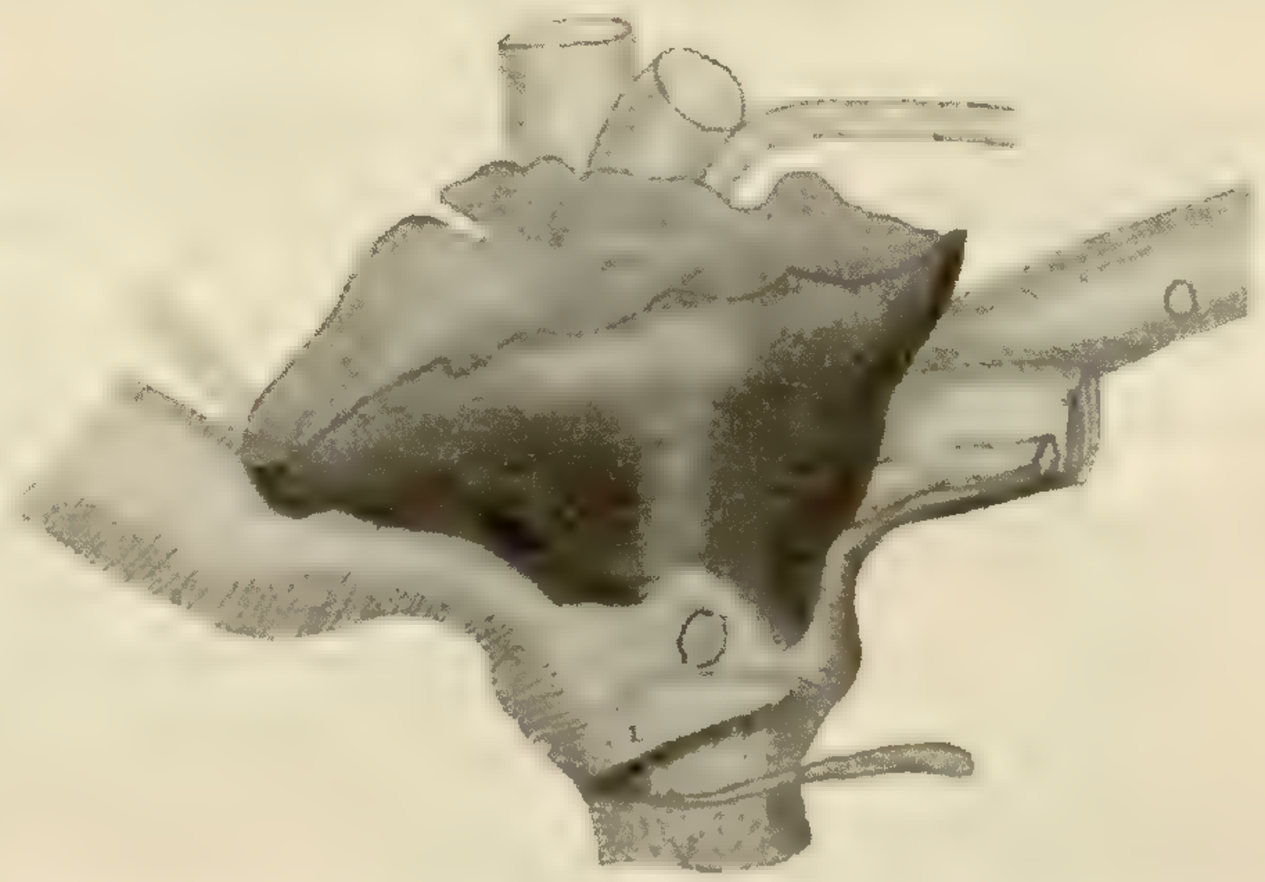

Fig. 11.
Trachéstamme af Larven til *Acronycta psi* med *Exorista blepharipoda*-Larvens Tragt. $^{40}/_{1}$.

Snyltefluelarverne laa tilsyneladende ganske frit uden at være forbundne med Værten ved en Tragt, og Larvehude, der undersøgtes efter at Snylterne var gaaet ud, var ganske tomme, selv Hovederne var fuldstændig udtømte; kun hist og her fandtes ubestemmelige Cellerester og Rester af Trachéer. Ved Undersøgelse af disse opdagedes Larvernes Tilhæftningssteder. Tekstfig. 11 viser en Del af Sommerfuglelarvens Trachésystem, nemlig Grenen fra Spiraklet ind til Hovedstammen. Paa det Sted, hvor Grenen udmunder i Hovedstammen, er denne gennemboret, og fra Hullets Rande udgaar en mørkfarvet Kitintragt. Denne er af ringe Størrelse

i Forhold til Larvens i 3die Stadium, og jeg er derfor ikke ganske sikker paa, at disse er tilhæftede Tragten i den sidste Periode af deres Liv; derimod viser den Omstændighed, at jeg har fundet Resterne af 2det Stadiums afkastede Larvehude inde i de Fedtcellerester, der fandtes ved Tragten, at Larverne var fasthæftede til denne, i alt Fald medens de skiftede Hud og gik over i 3die Stadium. Værtlarven viste ikke Spor af Snylternes Æg, og det er ikke muligt sikkert at afgøre, hvorledes Snylterne trænger ind. De fuldvoksne Fluelarver borer sig ned i Jorden og forpupper sig her. Pupperne overvintrer, og Fluerne kommer frem næste Sommer i Juni Maaned.

Meigenia floralis Fall.

Udviklingen.

Ægget. Æggeskallen er 0,5 mm. lang, flad paa Undersiden, hvor den er klæbet til Værtlarvens Hud og fladt hvælvet paa Oversiden, uden Skulptur. Naar Ægget aflægges, er det endnu ganske uudviklet, og straks efter Æglægningen kan hverken Tornvæbningen, Svælgskelettet eller Spiraklerne iagttages paa Embryonet.

Larven i 1ste Stadium. Længde 1 mm.; Tornbælterne er vel udviklede og bestaar af smaa Torne, der staar tæt sammen i nogenlunde lige Rækker; 12te Led uden Torne; Svælgskelettet er lyst brunligt og svagt kitiniseret. Randene noget mørkere. Tanden er langstrakt, slank og svagt bøjet i Spidsen; de nedre Svælgplader staar stærkt ud fra de øvre, begge Par er omtrent lige lange, de nedre er noget smallere end de øvre og lige afskaarne bagtil, medens de sidstnævnte er afrundede (Tab. I Fig. 8.) Bagspiraklernes Atrium er langstrakt, i Spidsen svagt køllеformet, med 2 vel adskilte Knopper.

2det Stadium. Længde 2,5 mm. Forranden af 2—8. Led med Tornbælter, der paa 8de Led kun findes paa Undersiden. Bagranden af 5te Led paa Undersiden med et svagt Bælte; paa Bagrandene af de følgende Led tiltager Bælterne i Udstrækning og Bredde og gaar paa 10—11. Led helt omkring Leddene. Tornene staar i nogenlunde lige Rækker. Mundkrogenes Rod bærer fortil

en fremadrettet, i Spidsen lysere Knude og bagtil en lille, svagt bagudrettet Tap. Spidsen er slank, den indre Del krummet, den yderste næsten lige. Svælgskelettet er fortil mørkt og bagtil meget lyst; de øvre Svælgplader er brede, foroven afrundede og bagtil svagt tilspidsede, den nedre Rand lige; de nedre Svælgplader er betydelig kortere end de øvre (Tab. I Fig. 9). Forspiraklernes Atrium er stærkt kølleformet og ender — saavidt det har været mig muligt at se — med 2 ulige store Knopper; den ene er stærkt indskaaret i Randen og c. 5 Gange saa bred som den anden. Bagspiraklerne er svagt kølleformede med to dybt adskilte Knopper.

3die Stadium. Længde 11—14 mm. Forranden af 2—11. Led med Tornbælter, der paa 6—7. Led er afbrudte paa Siderne og paa 7—11. Led tillige mangler paa Rygsiden. Bagrandene af 5—11. Led med smallere Bælter; paa 5—8. Led findes Bælterne kun paa Undersiden, 12te Led er helt besat med Torne. Mundkrogene er i Forhold til Svælgskelettet store; fra Roden udgaar fortil under en omtrent ret Vinkel en Udvækst, der udadtil bliver smallere og i Spidsen er svagt bagudrettet, og bagtil en mindre, bagudrettet, afrundet Tap. Mundkrogenes Spids er jævnt krummet og udadtil meget smallere end det inderste Stykke; paa Inderranden findes et lille Hak umiddelbart foran Rodens forreste Udvækst. De forreste Svælgplader er knap halv saa lange som Mundkrogene og meget smallere end disses Rod; fortil er de noget tilspidsede. Forbindelsesstykket findes ved Bagranden og er paa Midten noget fremtrukket. De bageste Svælgplader er mørke ved Roden og lysere udadtil, de øvre er smalle ved Roden og bliver omtrent dobbelt saa brede paa Spidsen. Randene er lige og Spidsen jævnt afrundet, de nedre er noget kortere end de øvre, svagt bøjede og dybt indskaarne i Spidsen (Tab I Fig. 10). Forspiraklernes Atrium er cylindrisk og bærer 8—10 Grene, der hver ender med en oval Knop. (Tekstfig. 12). Bagspiraklernes Bygning er noget kompliceret, (Tab. I Fig. 11) Kitinrammen er bred og stærkt hvælvet, hvorved hele

Fig. 12.
Meigenia floralis.
3die Stadium.
Forspirakel. $^{150}/_{1}$.

Spiraklet bliver stærkt fremstaaende. Indenfor Rammen findes 3 omtrent lige store Felter; Atriet deler sig i 2 Grene, hvoraf hver gaar til et af de to Felter og atter her grener sig i flere smaa Grene, der ender med en lille indskaaret Knop. Imellem disse to Felter findes i Kitinrammen et blødhudet, liniedannet Felt, der med den ene Ende munder ud i det tredie Felt, der i Midten bærer Trachéaabningen. De 3 Felter er omgivne af en fin mørkfarvet Kitinliste, og saadanne findes ogsaa ved Roden af Kitinrammen. Denne er brunsort, noget mørkere ved Roden end paa den øverste Del.

Tøndepuppen. Længde 4—5 mm. Bredde c. 2 mm. Aflang, omtrent lige stærkt hvælvet paa Over- og Undersiden. Segmentgrænserne og Tornvæbningen tydelige. Lyst brunlig, glat og glinsende; Forspiraklerne fremstaaende. Bagspiraklerne findes som to divergerende Tappe noget opad paa Tøndepuppens Rygside. Gataabningen ikke fremstaaende men tydelig som en stor afrundet, lys Plade. De ydre Puppespirakler mangler.

Biologi.

Meigenia floralis Fall. er tidligere fundet hos 2 Bladbillelarver, *Crioceris quatuordecimpunctata* F. og *C. asparagi* L. Pantel[1]) har studeret dens Biologi og Udvikling i den sidstnævnte Arts Larver; et Referat af hans Undersøgelser findes i mit før citerede Arbejde. Jeg har fundet Snyltefluen hos en anden Bladbillearts Larver, *Gastrophysa viridula* de Geer. Denne hører her i Landet til de sjældnere Arter, men optræder nogle Steder i Omegnen af København i store Selskaber paa Rumex. Den har mindst 2 Generationer om Aaret. I de første Dage af Juni 1909 fandt jeg ved Ørholm talrige Biller i Parring og drægtige Hunner, men endnu hverken Æg eller Larver. Den 23de Juni havde Billerne afsat deres langstrakte, gullige Æg i Klumper paa Rumexbladenes Underside; her saas desuden unge Larver, der sad i smaa Selskaber

[1]) I Pantel: Sur la biologie du Meigenia floralis (Bull. soc. Entom. de France 1902. p. 56).

i Nærheden af de tomme Æggeskaller, og ældre Larver, der fandtes mere spredt. Blandt Bladbillelarvernes afstrøgne Larvehude, der bliver hængende paa Bladenes Underside, opdagedes et ikke ringe Antal, der bar hvide Flueæg, og nogle af Larverne havde ogsaa saadanne fæstede paa Huden. Et Par Hunner af *Meigenia floralis* sad paa Skræppebladene. Den 26de Juni fandtes Bladbillens Pupper ophængte paa Bladenes Underside, og den 16. Juli var alle Larver og Pupper forsvundne, medens en ny Generation af Billerne var kommen frem, og Æglægningen allerede begyndt.

Kun en ringe Del af Bladbillelarverne var inficerede med Snyltefluernes Æg. Jeg indsamlede ialt 79 Billelarver med Flueæg; heraf var 36 endnu ikke fuldvoksne, nogle var ganske smaa og andre stod lige for det sidste Larvehudskifte. I ingen af alle disse Værter kom Snylteren til Udvikling, som Følge af, at Værterne skiftede Hud, før Snylterne havde naaet at bore sig ind, og Æggene blev strøget af sammen med Billelarvernes gamle Hude, til hvilke de var fæstede. Ved Undersøgelse af Æg, der fandtes paa disse Hude, fandt jeg i nogle fuldt udviklede Larver, hvis Svælgskelet i flere Tilfælde var rettet imod Æggeskallens Bund, som om Snylteren var i Færd med at bore sig ud igennem denne. Resten af Bladbillelarverne — 43 — var fuldvoksne, heraf aabnedes til forskellig Tid 17, af hvilke 3 indeholdt Fluelarver; i Resten af Billelarverne var Snylterne endnu ikke trængt ind. De sidste 26 Bladbillelarver hensattes til Klækning, og i Dagene fra 10.—16. Juli fremkom 10 Fluer og 16 Biller, idet Larverne, hvoraf disse sidste kom ud, havde forpuppet sig, før *Meigenia* Larverne havde boret sig ind.

Det højst ejendommelige Forhold, at en saa betydelig Del af Bladbillelarverne undgik at blive dræbt af Snylterne ved simpelthen at skifte Hud, maatte naturligvis foranledige nogen Tvivl med Hensyn til Iagttagelsens Rigtighed. Den Antagelse laa nær, at de unormale Forhold, hvorunder Værtlarverne levede under Klækningen, paa en eller anden Maade influerede paa Snylterens Udvikling, særlig da Pantel havde fundet Snyltefluens Larver baade i yngre og ældre Larver af *Crioceris asparagi*. Af en Undersøgelse ude i

Naturen fremgik det imidlertid, at Forholdene var ganske de samme her, idet en Del af de afstrøgne Larvehude, der fandtes fasthæftede til Bladenes Underside og hidrørte dels fra yngre dels fra fuldvoksne Larver, var besatte med Flueæg. Hvad der er Grunden til dette Forhold er vanskelig forklarligt, og jeg skal kun fremhæve en enkelt Betragtning, der muligvis kan give Forklaringen. Ved de fleste Klækninger i større Stil af Larver med Snyltefluеæg hænder det, at enkelte Værtlarver skifter Hud, førend Snylteren har boret sig ind; disse Værtlarver er saadanne, der staar umiddelbart foran et Hudskifte i det Øjeblik, Snyltefluen lægger sine Æg paa den. Disse Tilfælde indtræffer hyppigst hos saadanne Snyltefluer. hvis Æg bliver siddende i længere Tid paa Værterne forinden Larvernes Indboring finder Sted. I disse Forhold er der en ikke ringe Variation hos de forskellige Snyltefluearter, og *Meigenia floralis* Fall. forekommer mig, som ovenfor anført, at være en Art, hvis Æg aflægges paa et temmelig tidligt Udviklingstrin og hos hvilken derfor Tidsrummet mellem Æglægningen og Larvens fuldstændige Embryonaludvikling og paafølgende Indboring i Værten er usædvanlig lang. Snylterne havde saaledes endnu ikke den 29. Juni boret sig ind i Værtlarver, der var indsamlede den 23. s. M. Da Bladbillelarvens Udvikling, som den foranstaaende Oversigt viser, gaar hurtigt for sig, er det forstaaeligt, at en stor Del Snyltefluеæg lægges paa et saa kritisk Tidspunkt, at Værtlarven naar at skifte Hud, før Snylteren er kommen saa vidt i sin Udvikling, at den kan bore sig ind.

Jeg antager, at denne Forklaring er rigtig, men det er dog paafaldende, at jeg ikke fandt en Snylter i en eneste af de ikke fuldt udvoksne Bladbillelarver. Selv om en saadan Indboring imidlertid havde fundet Sted, vilde Snylteren utvivlsomt være gaaet til Grunde, da de mindre Bladbillelarver er alt for smaa til at afgive Ernæring til Snylterens fulde Udvikling.

Af de 79 Larver bar de 75 kun et Æg og 4 to Æg. Disse sad i Ledhudene imellem Thoraxleddene og de forreste Bagkropsled,

i Reglen paa Larvens Overside henimod Siderne, i sjældnere Tilfælde fandtes Æggene paa Værternes Bugside.

Med Hensyn til Larvernes Udvikling har jeg intet at anføre til Pantels Fremstilling. Jeg har fundet Larven i 1ste Stadium frit inde i Værten; 2det Stadium derimod sad fasthæftet til en Tragt, der udgik fra en Ledhud paa Undersiden af Værtlarvens Bagkrop. En Larve i 3die Stadium havde løsnet sin Bagende fra Tragten og fandtes frit i Værten; den havde vendt sig saaledes, at Forenden var rettet imod Tragten, medens Bagkropspidsen vendte den modsatte Vej; Værtens indre Organer var ubeskadigede og hele Fedtlegemet endnu ikke helt forsvundet; nogen Sønderrivning af Værtlarvens Hud kunde ikke ses. Denne skete først samtidig med Snylterens Forpupning, der oftest fandt Sted inde i Værtlarven, og sjældnere i Jorden. Omtrent 14 Dage efter Forpupningen kommer Fluerne frem.

Actia pilipinnis Meig.

Udvikling.

Larven i 3die Stadium. Larvens største Bredde falder umiddelbart foran Bagenden, der er skarpt afsat og udtrukket i en kegleformet Spids. Længde 6—8 mm. 3—11. Leds Forrande med Tornrækker og 4—11. Led tillige med Rækker paa Bagrandene. Bælterne bliver bredere bagtil paa Larven og lader her kun et smalt Mellemrum paa Midten af Leddene frit for Torne. Bælterne sammensættes af Smaarækker, der særlig bagtil er stillede meget aabent og uregelmæssigt (Textfig. 13). 12te Leds Spids omkring Spiraklerne med et Bælte af Torne i temmelig lige Rækker; herfra udbreder sig en Del uregelmæssige Smaarækker fremad henimod Leddets Forrand. Tornenes Form er forskellig; fortil findes langstrakte, meget smalle og spidse Torne, hvis Spids staar ret op fra den afrundede Rod; henimod Larvens Bagende begynder der imellem disse Torne at optræde andre, hvis Spids er kløvet saaledes, at der dannes 2 mere eller mindre skarpe, udadrettede Spidser, imellem hvilke der atter kan optræde en enkelt lille, skarp Spids

(Textfig. 14). Der findes Overgange imellem de kløvede og de enkeltspidsede Torne; de største af de førstnævnte findes paa Undersiden af 10—11. Led; dog er Tornene paa Bagranden af 11te Led og paa 12te Led alle udelte.

Fig. 13.

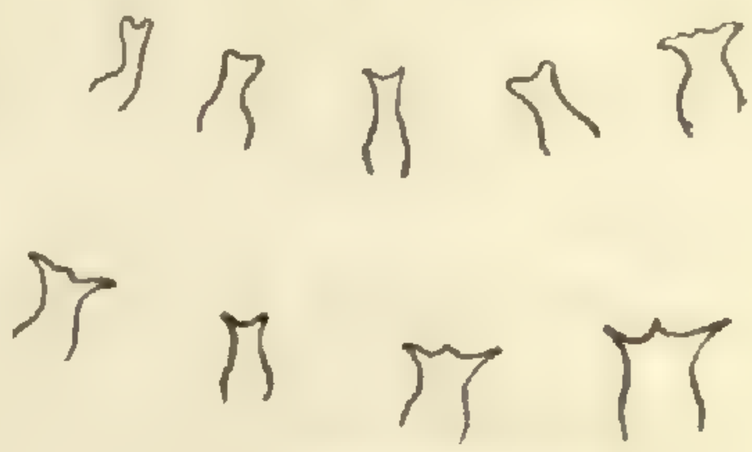

Fig. 14.

Actia pilipennis 3. Stadium Fig 13. Tornrækker. $^{75}/_{1}$.
Fig. 14. Torne fra 11. Leds Rygside. $^{410}/_{1}$.

Tornenes Udfarvning foregaar meget langsomt. Ved Hudskiftet udfarves straks Tornene paa 11te Leds Bagrand og paa 12te Led, medens alle andre Torne endnu er usynlige; først naar Larven er fuldvoksen, udfarves de andre Torne, først de udelte og senere de kløvede. Mundkrogenes Rod er smal, bagtil afrundet; fortil findes lidt foran Roden en plump Knude, og foran denne et lille tandformet Fremspring. Spidsen er jævnt buet; de forreste Svælgplader er fortil saa brede som Mundkrogenes Rod og bliver ubetydelig bredere bagtil. Forbindelsesstykket findes lidt bagved Midten af Pladerne; de øvre Svælgplader er brede og jævnt afrundede; de er sorte med lysere Rande, idet den mørke Farve dog paa enkelte Steder naar helt ud til Randen. De nedre Svælgplader er omtrent saa lange som de øvre. Foroven findes tæt foran Spidsen en opadbøjet, afrundet Tap. (Textfig. 15).

Fig. 15.
Actia pilipennis.
3. Stadium; Svælgskelet.
$^{100}/_{1}$.

Forspiraklernes Atrium er ved Roden i Tværsnit rundt og saa bredt som Trachéen, udadtil bliver det bredere og udflades

henimod Spidsen, bagtil er det stærkt indbugtet og ender fortil med 6 Grene, der er korte og stillede i en lige Linie. Grenene er buede udad og ender hver med en oval Knop (Textfig. 16—17).

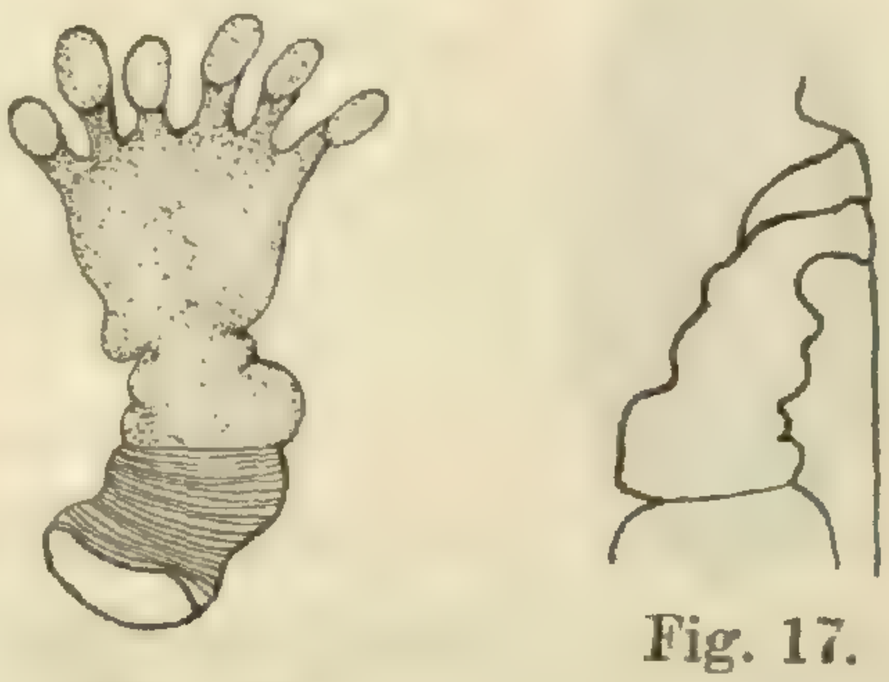

Fig. 16.

Actia pilipennis 3. Stadium. Forspirakel, Fig. 16 forfra, Fig. 17 fra Siden. $^{150}/_{1}$.

Fig. 17.

Bagspiraklernes Atrium (Textfig. 18) er kort og løber ud i 3 korte Grene, der hver bærer en aflang Knop (b). Grenene staar frit frem i et Felt, der omgives af Spiraklets Kitinramme (a), der hos denne Art ikke slutter tæt omkring Knopperne[1]). Gataabningen findes ved Forranden af 12te Led.

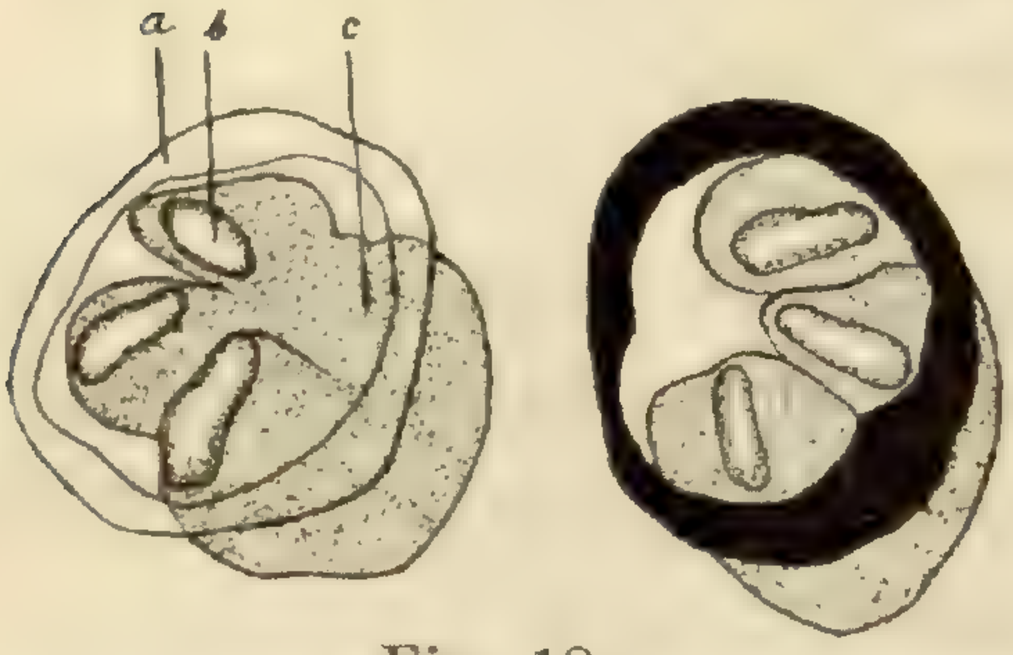

Fig. 18.

Actia pilipennis 3. Stadium. Forspirakler. a. Rammen. b. Knop. c. Atriet. $^{125}/_{1}$.

Tøndepuppen. Længde 5—6 mm. Bredde 2—2,5 mm. Farven er sortebrun eller brunlig, stærkt glinsende. Langstrakt, Oversiden stærkt hvælvet, særlig bagtil. Undersiden noget fladere. Segmentgrænserne tydelige, men ikke indskaarne. Overfladen glat og glinsende. Paa Oversidens 3—4 og 6—9 Led findes paa hver Side et aflangt, indtrykt Felt og langs ned ad Tøndepuppens Sider en Række liggende, mindre og svagere Indtryk, der viser de Punkter, hvor Trachéstammernes

[1]) Efter at jeg har haft Lejlighed til paa et større Materiale af *Actia*-Larven at undersøge Bagspirakler af denne Type, er jeg kommen paa det rene med, at det af mig tidligere (Iagttagelser over entoparasitiske Muscidelarver 1909 Pag. 85) beskrevne Bagspirakel hos en Snyltefluelarve fra en *Lithobius*, hvoraf jeg kun besad et Eksemplar, tilhører den samme Type. Kitinrammen, som jeg da henførte til Atriet, har intet med dette at gøre, men omgiver som hos *Actia*-Larven kun dettes Grene; iøvrigt er Spiraklerne kun forskellige ved Grenenes Antal. 3 hos *Actia*-Larven, 8 hos *Lithobius*-Snylteren. Denne Overensstemmelse i Bagspiraklernes Bygning tyder paa, at *Lithobius*-Snylteren er Larven til *Discochaeta Lithobii* Giard, idet denne Slægt er nær beslægtet med *Actia*.

obliterede Sidegrene naar ud til Larvens Hud. Forspiraklerne fremstaaende. Tøndepuppens Bagende er trukket ud i en stærkt fremstaaende, grovt rynket Tap, som paa Spidsen bærer de 2 Bagspirakler. Gattet er ikke fremstaaende, men let iagttageligt som en lille, cirkelformet, skarpt afsat Fordybning. De ydre Puppespirakler mangler.

Fig. 19. *Actia pilipennis* Tøndepuppe. $^5/_1$.

Biologi.

Actia pilipennis Fall. er tidligere klækket af flere forskellige Microlepidopterers Larver, bl. a. af *Retinia resinella* L. og *Retinia buoliana* Schiff., hos hvilke Arter jeg ogsaa har fundet den.

I Juli 1909 fandt jeg paa et begrænset Parti af en yngre Bjærgfyrplantning i Tisvilde Hegn et ret stort Antal Skud, der viste det for *Buoliana*-Angreb karakteristiske Udseende. I Skuddene fandtes saavel Viklerlarver som Pupper og i en stor Del af dem laa den lille *Actia*-Puppe ved Siden af den døde Vært.

Ved Dissektion af *Retinia*-Larverne og Pupperne fandt jeg endvidere flere *Actia*-Larver i 3die Stadium. Snylterne var fasthæftede Værternes Hudskelet ved en stærkt fremtrædende Tragt af sort Farve og laa i en tydelig Sæk.

Snyltelarverne bruger kun en mindre Del af Værtens Organer til deres Ernæring, og dennes Form forandres som Følge heraf ikke, efterat Snylteren har dræbt den og har boret sig ud. Efter Udboringen forpupper Snylteren sig i Værtlarvens Gang i Fyrreskuddet, undertiden lige ved Siden af Værten, saaledes at Puppen ligger i en dyb Indhuling i Værtens Krop. Puppetiden varer kun ganske kort Tid, 8—14 Dage, og naar Fluen er kommet ud, sprænger den Hul i Fyrreskuddet.

I hver *Retinia*-Larve kommer kun én Snylter til fuld Udvikling.

Actia pilipennis har mindst 2 Generationer aarlig. Ved Tisvilde kom 1ste Generation frem af *Retinia resinella*-Gallerne i Maj—Juni; denne Generation inficerer Larverne af *R. buolinana*, der paa dette Tidspunkt er fuldvoksne, og næste Generation udvikles i Juli. Hvor denne Generations Yngel anbringes, har jeg ikke kunnet finde.

Summary.

1. **Carcelia gnava** Meig. [1]).

This species was reared from *Stilpnotia salicis* and *Malacosoma neustria*. On a willow hedge a great number of various caterpillars were seen in July and August 1905 and at the same time some moths of *Stilpnotia* were observed there occupied with the oviposition. The number of this species was not extraordinarily great, but in the following years the number increased so much that in 1907 the caterpillars had eaten all the leaves of the willows. In June that year I found a great number of moths and at the same time many pupæ, which were conglomerated in lose spins among the leafless branches and not, as in normal cases, singly hided in a contorted leaf. On the willows also many full grown and younger caterpillars were climbing in search for foot. The *Carcelia gnava* was present, but in so small numbers that I only succeded in rearing one single specimen from a great number of the caterpillars.

In 1908 the number of caterpillars was somewhat decreasing and in the next year 1909 most of the willows were green, still the number of caterpillars was considerable. By means of proofs from diverse points of the hedge it was found that a little more than 50 % of the caterpillars were infested with maggots of *Carcelia gnava*. In 1910 only a few caterpillars were seen and of these allmost all were killed by the parasites before they were half grown.

The eggs of the fly are pedicelled, the chorion is thin and transparent; the surface shows a network of ridges enclosing polygonal areas. The posterior end of the shell is produced into a thread-like prolongation, the end of which is slightly dilatated and

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[1]) The fly which I named *Carcelia gnava* in a previous paper (Iagttagelser over entoparasitiske Muscidelarver hos Arthropoder Kbhvn. 1909) has been examined by Dr. J. Villeneuve, who kindly has communicated to me, that it belongs not to this species but to *Carcelia comata* Rond.

bent in an angle. This end is immersed into a little cluster of a secretion, by means of which the egg is attached to the host. As a rule the fly deposites its eggs on the hairs of the host, but sometimes also on the skin [1]).

At the time of oviposition the embryo of *Carcelia gnava* is at a very little advanced stage of development, neither the tracheal system, the spines or the pharyngeal skeleton could be observed. The hatched maggot moves about on the host and penetrates into it through a hole which is produced in its skin. In its first stage the maggot lives free inside the host, but the maggots in 2' and 3' stages are connected with the integument of the host by means of a chitinous funnel, which originates in most cases from a membrane between two segments of the host.

In the case of *Stilpnotia sacilis* the fly deposites its eggs both on younger and elder caterpillars. Corresponding to the size of the host from one to four parasites can develop. The colour of the markings, which is white in normal caterpillars, is turned into a yellow colour in the infested specimens. The younger infested caterpillars do not moult anymore, but fasten themselwes, when they are dying, to a branch or a leaf by means of their suckers, and the emptied skins remain for a long time on the trees. The full grown infested caterpillars make a very rudimentary spin. The larval skin bearsts on the foreend, and the pupa begins to emerge; at this time, however, the host is killed by the parasites. These pupæ are very easily recognized by their strange form. In some rarer cases I found the parasites in fully developed pupæ.

In the case of *Malacosoma neustria* I have only found the parasites in full grown caterpillars, and that in spite of the fact

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[1]) In this connection I think a short mention of another tachinid egg, which I have found on the hairs of a caterpillar of *Acronycta menyanthidis*, may be of some interest. The dimensions of the egg were 0.50—0.25 mm., the upperside was rather strongly curved and the lower side which was attached to a hair of the caterpillar quite flat. The fly was not reared and beside the egg I only know the first stage in which the pharyngeal skeleton shows the most striking resemblance to that of the maggot of *Carcelia gnava*.

that on the trees, where I collected the infested fullgrown specimens, many younger were present, all of which were not infested.

The maggots transform to puparia in the ground; in very rare cases in the empty skins of the hosts. I have seen maggots pupate in the days from $^{9}/_{7}$—$^{15}/_{7}$, the flies emerging from $^{25}/_{7}$—$^{3}/_{8}$ the same year.

Exorista blepharipoda B. & B.

I have reared this fly from the caterpillars of *Acronycta psi* L. and *A. tridens* Shiff. The skin of the hosts shows no marks indicating the presence of the maggots inside the body. In each host may occur from 2—7 living parasites. After the emergence of the full grown maggots all the organs of the hosts have disappeared. By an examination of the respiratory system of the host I succeded in finding the points, where the parasites were connected with the hosts body. The chitinous funnel originates from a trachea and in cases from the point, where the main trachea is connected with the stigmatal branch.

The maggots transform to puparia in the ground and the flies are reared next summer ($^{6}/_{6}$—$^{27}/_{6}$).

Meigenia floralis Fall.

Meigenia floralis is a parasite in the larvæ of a chrysomelid beetle *Gastrophysa viridula* De Geer. On the 23th of July I saw both younger and elder larvæ with eggs of the fly and among the moulted skins of the larvæ, which remain attached to the underside of the leaves, several were noticed bearing egss. Only a relatively small number of the larvæ were infested by the parasites. In all I collected 79 infested larvæ. Of these 36 were not fullgrown; in not a single of these the parasite came to full development; the host moulted before the parasites hatched out of the eggs, and the eggs which were deposited on the skins were threwn off together with these. The rest of the larvæ — 43 — were full grown; of these 17 were dissected from time to time, and by means of these dissections I succeded in finding 3 parasites; in

the rest the parasites had not penetrated. The last part of the hosts were put aside for rearing the parasites and in the days from the 10th—15th of July 10 specimens of *Meigenia* and 16 beetles emerged, the larvæ which gave issue to the last named having passed into the pupa stage before the parasites had hatched out of the eggs. It seemed quite reasonable to suggest that the unnatural conditions under which the larvæ had lived during the breeding had influenced in some way on the development and caused so many of the hosts to escape from being killed by the maggots simply by means of moulting; but it is not so; as already mentioned I also saw the same in the nature. The reason of this is somewhat difficult so to explain and I shall only give suggestions. The embryos of *Meigenia floralis* are at the time of the oviposition at a very little advanced stage of development, and the space of time between the oviposition and the emergence of the maggot rather long. On the other hand the growth of the hosts is very rapid. Therefore it is probable, that a great part of the eggs are deposited at so critical a moment that the hosts reach their next moult, before the maggots are mature to emerge from the eggs. I think that this explanation is correct, but I shall only point out the strange fact, that not a single of the eggs, deposited on younger hosts gave issue to maggots.

With respect to the life history of the maggots my investigations have confirmed those of J. Pantel.

Actia pilipennis Fall.

In the month of July I found on some young pinetrees a rather considerable number of branches which were deformed by *Retinia buoliana*. In the larval chambers I found the puparium of *Actia pilipennis* lying close to the dead hosts, and by opening some larvæ and pupæ I secured some maggots which were connected to the integument of the hosts by means of very strong and conspicuous funnels. Only a little part of the organs of the hosts were consumed by the parasites and the host retains its form after

the emergence of the parasites. The maggots pupate close to the dead hosts, in the body of which they ordinarily produce a deep excavation, which is quite filled up by the puparium. In each host only one parasite develops.

Actia pilipennis is at least double brooded. At Tisvilde the first brood was reared in May from *Retinia resinella*, and the flies then infested the caterpillars of *R. buoliana*, which at that time were almost fullgrown; from these the flies emerged in July and August.

Explanation of the figures in the text.

Fig. 1 (p. 2) Egg of *Carcelia gnava* on a hair of *Stilpnotia sacilis*.
— 2 (p. 2) — — — on the skin of — —
— 3 (p. 4) *Carcelia gnava* 2' stage. Anterior spiracle.
— 4 (p. 4) — — 3' — — —
— 5 (p. 4) — — 3. — Posterior spiracles.
— 6 (p. 7) Egg of a not reared tachinid fly on a hair of *Acronycta menyanthides*.
— 7 (p. 7) The pharyngeal skeleton of a maggot taken out of the egg figured in fig. 3.
— 8 (p 8) Young caterpillar of *Stilpnotia sacilis* killed by *Carcelia gnava* and hanging down from a branch after the emergence of the parasite.
Fig. 9 (p. 10) *Exorista blepharipoda*. Spines from the side of the mouth.
— 10 (p. 10) — — 3' stage. Anterior spiracle.
— 11 (p. 11) Trachea of an *Acronycta* with a funnel of a maggot of *Exorista blepharipoda*.
— 12 (p. 13) *Meigenia floralis* 3' stage. Anterior spiracle.
— 13 (p. 18) *Actia pilipennis* 3. stage. Rows of spines.
— 14 (p. 18) *Actia pilipennis*. Furcated spines from the dorsal side of the 11th segment.
— 15 (p. 18) *Actia pilipennis* 3' stage. Pharyngeal skeleton.
— 16 (p. 19) — — — Anterior spiracle.
— 17 (p. 19) — — — — Sidewiev.
— 18 (p. 19) — — — Posterior spiracle (Only the outlines of the border of the left spiracle have been drawn. a. border. b. respiratory knob[1]). c. atrium.
— 19 (p. 20) *Actia pilipennis* Puparium.

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[1]) I have formerly described a similar spiracle from a maggot parasitic in a *Lithobius*. I supposed that the maggot belonged to *Discochæta lithobii* a species which Giard had founded on flies reared from a *Lithobius*. Now I think that this suggestion is highly probable, because the *Discochæta* is closely related to *Actia pilipennis*.

Explanation of Plate I.

Carcelia gnava Meig.

Fig. 1. 1' stage. Pharyngeal skeleton. $^{180}/_{1}$.
— 2. 2' — — — — $^{115}/_{1}$.
— 3. 3' — — — — $^{54}/_{1}$.

Exorista blepharipoda B. & B.

Fig. 4. 1' stage. Pharyngeal skeleton. $^{215}/_{1}$.
— 5. 2' — — — — $^{102}/_{1}$.
— 6. 3' — — — — $^{45}/_{1}$.
— 7. - — Posterior spiracles. $^{105}/_{1}$.

Meigenia floralis Meig.

Fig. 8. 1' stage. Pharyngeal skeleton. $^{105}/_{1}$.
— 9. 2' — — — — $^{125}/_{1}$.
— 10. 3' — — — — $^{118}/_{1}$.
— 11. - — Posterior spiracles. $^{145}/_{1}$.

23.—12.—1910.

Echinological Notes

by

Dr. ***Th. Mortensen.***

III. The central (sur-anal) plate of the Echinoidea.

In a series of most interesting papers[1]) Dr. A. H. Clark has recently treated different points in the natural history of the Crinoidea in a very suggestive and ingenious manner, throwing new and important light on many questions in the physiology, phylogeny and morphology of Crinoids.

Among the conclusions arrived at by Dr. Clark one of the most startling is that of the near relationship between Crinoids and Echinoids. Though I am here decidedly in opposition to my excellent friend, as I have repeatedly emphasized in letters to him, it was not my intention to enter on a literary discussion of this matter, as a refutation of the reasons on which Dr. Clark has founded this conclusion would necessitate a thorough treatment of nearly the whole of the comparative morphology of the Echinoderms; but for such a work, most interesting though it would be,

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[1]) The homologies of the arm joints and arm divisions in the recent Crinoids of the families of the Comatulida and the Pentacrinitidæ. Proc. U. S. Nat. Mus. 35. 1908. — The non-muscular articulations of Crinoids. American Naturalist. 43. Oct. 1909. — The affinities of the Echinoidea. Americ. Natural. 43. Nov. 1909. — On the Origin of the Crinoidal muscular articulations. Amer. Journ. Sc. 29. 1910. — The probable origin of the Crinoidal nervous system. Amer. Natural. 44. Apr. 1910. — Remarks on the pentamerous symmetry of the Crinoidea. Amer. Journ. Sc. 29. Apr. 1910. — The phylogenetic interrelationships of the recent Crinoids. Proc. U. S. Nat. Mus. 38. May 1910. — On the Origin of certain types of Crinoid stems. Proc. U. S. Nat. Mus. 38. June. 1910.

I cannot afford the necessary time, for the present at least. The last of the quoted papers, however, contains a passage which has made me think it appropriate to take up a single point for treatment at present, the more so as this is one of the main points in the question about the relationship between Crinoids and Echinoids, viz. the central (suranal) plate of the Echinoids.

In the quoted paper „On the Origin of certain types of Crinoid stems“ Dr. Clark says (p. 211) that I have criticized him for homologizing the column of the crinoid with the sur-anal plate of the urchins „on the ground that the so-called „Palæoechinoidea“, the oldest known echinoids, lack the sur-anal plate“. It might appear from this that the lacking of the central plate in the Palæechinoids was the only reason which I could produce against homologizing the central plate of Echinoids with the stem (or the dorso-central) of Crinoids. This is, however, very far from being the case; the Palæechinoids afford only one of several reasons against that homology; I may be blamed for having named only this single point in my letter, but I may give the excuse that it was a letter, not a scientific paper. — Thinking now (partly through my fault) that the Palæechinoidea are the only forms of Echinoids in which the central plate is lacking, Clark has done away with this difficulty for the said homology through the following reasoning: „In the structure of the test the „Palæoechinoidea“ are in certain ways far more specialized than any recent species, and, as specialization is usually accompanied to a greater or lesser degree with the suppression of more or less fundamental primitive structures“ it may be understood that the central plate has been suppressed here. „I (Clark) assumed that, although *the sur-anal plate was usually retained in a more or less reduced form by all recent types*[1]), there was no reason for supposing that, were the recent genera to attain multicolumnar ambulacral and interambulacral areas instead of their more primitive bicolumnar areas,

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[1]) The italics are mine.

such an advance would not be accompanied by the dwindling and disappearance of the sur-anal. Because the clavicles are small or entirely absent in the mostly extinct Ratitæ, while in all cases well-developed in the mainly recent Carinatæ we can not pronounce them unessential features of vertebrate morphology".

This reasoning might, perhaps, be acceptable in case the Palæechinoids were really the only Echinoids in which the central plate is lacking — though several severe objections might be raised against it; this being, however, not the case, the whole argumentation falls short, and the only natural explanation of the facts is to assume that the central or suranal plate has not yet made its appearance in the Palæechinoids.

The plan of the present note is not to give a historical account of the question, only to give a critical examination of the central (suranal) plate in the different groups of Echinoids, in order to show whether it is really an essential feature of Echinoid morphology, as maintained by Clark (in accordance with Lovén and P. H. Carpenter), or it is a late acquisition in Echinoids, developed independently here, not inherited from the ancestors of Echinoidea, as I think (in accordance with A. Agassiz[1]), the Sarasins, Neumayr, Jaekel, Semon, Gregory, MacBride,

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[1]) In the «Challenger» Echinoidea (p. 13) Agassiz says: „As Loven has well shown in the older Echinids (*Cidaris* and *Salenia*), we find all the proof we need of the crinoidial character of the apical system of the Echinidæ; the calyx being more and more unimportant, though it always reveals its typical features". Later on he has changed his opinion on this matter. In his Monograph on Calamocrinus he declares that the apical system of Echinoids with a single large suranal plate does not represent the primitive condition and that this plate cannot be homologized with the central plate of Crinoids. „In the Crinoids the central area is occupied by a stem or its representative, and it seems to me more natural to homologize this central area of the Echini and of the Crinoids than to attempt, as has been done, to pick out a single anal plate of the Echini which does not exist in many recent families, and probably not in many fossil types, and homologize it with the central plate of Starfishes or of Ophiurans and the terminal plate of the stem of the larval Comatulæ, as has been done by Carpenter" (Op. cit. p. 69).

Bather). Though this has already been done by several authors (Lovén, Agassiz, the Sarasins, Neumayr), I think the revision of the question given here will prove not to be superfluous, partly in view of the several new facts brought forward of later years, partly because my interpretation of some of the facts and statements differs not inconsiderably from that of my predecessors.

The Palæechinoidea (— the name used in its wide sense —) have no central plate, so far as known. In those forms of which the apical system is known, there are circles of small plates, arranged along the border of the anal area, and it seems scarcely too hardy to suppose that they all had their anal system built after this plan, without a central (suranal) plate. In the Cystocidaroida the whole apical system appears even to be totally wanting, a fact which, as is rightly pointed out by Gregory, „appears fatal to the theory assigning a crinoid ancestry to the Echinoidea“ [1]) and to the homology between the plates of the apical system in Echinoids and those of the calyx in Crinoids.

A. Agassiz (Calamocrinus Diomedeæ. p. 72 [2]) suggests that „while it is true .... that the apical system of the Palæchinidæ, as far as the adult is concerned, presents no trace of the anal plate so prominent in young Echinoids, and which is permanent in Salenia, yet there is nothing to show that the young of those genera did not possess, like the Euechinoidea, a single central anal plate in their earliest stages“. The facts known from the other Echinoids, as set forth below, seem to me, on the contrary, to show that there is no probability at all for supposing that the young stages of the Palæechinoids did possess a single anal plate. Agassiz also expresses this latter meaning later on in the same paper (p. 83): „the history of the plates of young Cidaris .... is decidedly opposed to this view“. Thinking to have proved that the young *Cidaris* has five radial anal plates (infrabasalia), he con-

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[1]) I. W. Gregory. On Echinocystis and Palæodiscus — two Silurian Genera of Echinoidea. Quart. Journ. Geol. Soc. LIII. 1897. p. 132.

[2]) Mem. Mus. Comp. Zool. XVII. 1892.

cludes that „we are therefore justified in assuming that in the Palæchinidæ there may have been in the young a similar radial system of five plates“. It may be stated that the facts known of the anal plates in the Palæechinoidea do not support this suggestion any more than that of the presence of a primordial suranal plate. In *Bothriocidaris* the outer ring of anal plates is even decidedly interradial in position, as shown in Fig. 1 (Comp. Jaekel: Über die älteste Echinidengattung Bothriocidaris. Sitz. ber. Ges. naturf. Fr. Berlin. 1894. p. 245).

Fig. 1. Apical system of *Bothriocidaris*. (The small outer plates represent the genital not the ocular plates, as one might be inclined to conclude from the figure.) After Jaekel.

The Cidaroidea. The development of the apical system has been described by Döderlein, A. Agassiz, Lovén and the present author. Döderlein (Die Japanischen Seeigel. I. Cidaridæ u. Saleniidæ. 1887. Taf. V. Fig. 8, p. 28) describes and figures the apical system of a specimen of *Goniocidaris biserialis* of 3 mm diameter. „Genital-, Ocular- und Analplatten waren bereits gesondert; das Analfeld (nicht grösser als eine Genitalplatte) war von sieben Platten bedeckt, die nach dem Verlauf der Nähte deutlich darauf hinwiesen, dass eine einfache ursprüngliche Analplatte erst in zwei, dann in drei Stücke zerfallen war, deren jedes sich nun weiter theilte“. (Fig. 2). It must certainly be agreed that this young stage does not prove that there was originally a single anal plate, which later on broke up into several smaller ones, and the young stage (4 mm diameter) of *Plococidaris (Leiocidaris) verticillata*, which Döderlein figures (Op. cit. Taf. IX. Fig. 8) shows a quite similar arrangement and number of the anal plates, and thus cannot prove anything in this regard either.

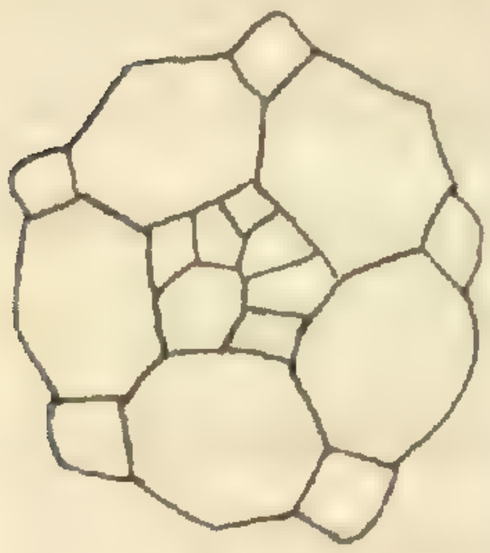

Fig. 2. Apical system of a young *Goniocidaris biserialis* (3 mm). (After Döderlein).

A. Agassiz figures in the „Revision of Echini“ Pl. II. c. fig. 8 the apical system of a young specimen of *Dorocidaris*

papillata of 2,4 mm diameter: Though the limits of the plates on the anal area are not distinctly shown in the figure, it is certain that there is no trace of a primordial central plate, and Agassiz so far rightly states (Calamocrinus, p. 74) that „there is nothing known to prove that in the Cidaridæ the anal system is not in the earliest stages covered by five plates, as in the Arbaciadæ it is covered by four".

The above quoted descriptions of the anal system of young Cidarids do not prove anything definite as to the question whether there is originally a single large suranal plate or not, the specimens being already too old. It is through the embryos of *Austrocidaris canaliculata*, *Rhynchocidaris triplopora* and *Notocidaris gaussensis* that we have gained definite knowledge thereof, all these species having care of the brood, so that stages young enough to show the first formation of the anal plates have been comparatively easily obtainable.

A pair of young specimens of *Austrocidaris canaliculata* are figured on Pl. II. figs. 8—10 of the „Challenger" Echinoidea, without showing, however, any details of the apical system. A more detailed study of the development of the test of this species was first given by Lovén, in his „Echinologica"[1]), the result of his researches being, as regards the anal system, that „in the centre there is a small, clear, irregularly pentagonal space, covered by the general integument (Pl. II. fig. 3). In another specimen (Pl. II. fig. 5) this space has just been filled with the dorso-central disk (Pl. II. fig. 6), a still delicate pentagonal lamina of reticulated calcified tissue, with its thin margins now overlying, now underlying those of the costals, in its middle thickened and raised into the beginning of a verruca". (Op. cit. p. 5—6).

Here then it seems that the presence of a suranal (central) plate in the Cidarids has been definitely proved; especially the quoted fig. 6 of Lovén's paper seems convincing. Nevertheless

[1]) Bih. Sv. Vet. Akad. Handl. 18. 1892.

it is not so. In the „Panamic Deep Sea Echini“ (p. 4, fig. 15) A. Agassiz gives a detailed figure of the anal area of a specimen 1,5 mm in diameter, showing „that in the youngest stages, about the size of that examined by Lovén, there are already five anal plates“; as shown by the figure (Pl. 13, fig. 6) there are three outer, larger plates and two quite small ones inside these. I have myself examined a specimen in exactly the same stage as that figured by Lovén in the quoted Fig. 6, Pl. II, and can say that the apparent large central disk is not really a single plate; I found there three distinct plates, slightly overlapping with their edges so that it could only be ascertained by a very careful examination that it was not a single plate.

In „Die Echinoiden der deutschen Südpolar-Expedition“ [1]) I have figured (Taf. XI, Fig. 4) a young stage of *Rhynchocidaris triplopora* showing the first development of the anal plates. It shows a single small plate lying in the space left between the five large genital plates; in another specimen two other small plates had just appeared in the anal area. Evidently we have then here the same mode of development of the anal plates as in *Austrocidaris canaliculata*, several small plates appearing almost contemporaneously. Certainly one of these plates appears in *Rhynchocidaris* a short time before the others; but it seems to be quite unjustified to lay so much stress on this fact as to claim on that ground alone the homology of this small plate with the central plate of Salenids — or even with the dorso-central plate of Crinoids. It is then not quite correct in the description of this developmental stage, that I have noticed the first formed plate as „die Analplatte“ (Op. cit. p. 11).

In the work quoted I have described a young stage of 2 mm diameter of another viviparous Cidarid, *Notocidaris gaussensis* (p. 21). It is stated „dass ich am Analfeld nur eine Platte unterscheiden kann“. As this statement seems contradictory to the

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[1]) Deutsche Südpolar-Expedition. XI. Zoologie III. 1909.

acts known from the development of *Austrocidaris* and *Rhynchocidaris*, I have reexamined the question, the more so as I had scarcely fully realised the morphological importance of this statement, when that work was written, being at that time still not in doubt of the correctness of Lovén's view, that a central plate was typically present in the Cidarids. The reexamination of the specimen showed the above statement to be correct; there was really only one anal plate developed, occupying the whole — small — space between the five genital plates. In two other specimens of the same size, I find, however, in one three, in the other five or perhaps six anal plates developed; they were of somewhat different size, which means that they are not developed quite contemporaneously; but the difference is so gradual that there seems not the slightest reason to mark the first developed plate as a „central" or „suranal" plate. The plates were found covering one another with their edges so that it was only through dissociating the apical system (by Eau de Javelle) under the microscope that it became possible to determine the exact number of plates present. (One of the specimens examined was sent to me from the Berlin Museum through Dr. R. Hartmeyer, for which I may here express my gratitude).

A. Agassiz is inclined to lay some stress on the apparent fact that „the first formed anal plates occupy a radial position; that is, they occupy the same position which the so called infrabasals do in Ophiurans and Starfishes according to Carpenter and Sladen". — „These five radial plates always retain their prominence in the full grown Cidaris, and have as good a right to be considered as infrabasals as the plates considered as such in the Ophiuridæ and Starfishes by Carpenter and Sladen" (Calamocrinus, p. 74, 76). If this view were correct the early development of the anal plates should certainly be expected to show these five plates to begin nearly contemporaneously; this is, however, not the case. It has been shown that in the Cidarids thus far studied more closely, the anal plates appear from the beginning in the number

of one, two or three, sometimes five, and they cannot at all be said to be placed radially. Thus Pl. 13, fig. 6 of the „Panamic Deep Sea Echini“ shows only one of them radially placed, the two others being decidedly interradial in position. We may then safely drop the idea of a homology between the outer anal plates of Cidarids and the infrabasals of Crinoids. It is evidently simply a consequence of the fact that there is more room left in the corner between each two genital plates that a more prominent anal plate is generally found here.

It should further be pointed out that there is no indication of any anal plate ever breaking up to form several smaller plates, as suggested by Döderlein in the sentence quoted above (p. 31). The plates are seen to be each formed separately.

The Echinothuridæ, with their characteristic large anal area, covered by numerous small plates, do not beforehand convey the idea of a single plate covering the anal area from the first. Unfortunately very little is known regarding the development of their anal plates; upon the whole the young, postembryonal stages are not known of any Echinothurid as yet, the youngest specimens known being 3 mm in diameter. A. Agassiz (Revision of Echini, p. 273. Pl. II. c. figs. 1—5) mentions and figures a specimen of that size, which he refers to *„Asthenosoma“ hystrix*. He gives, however, no description of the apical system of the specimen, so it is of no interest in this connection (— quite apart from the fact that its identification is very uncertain —). The „Ingolf“-Expedition collected several young specimens of *Phormosoma placenta (Sigsbei)*, the smallest of which were 3 mm in diameter. In the Part II of my work on the Echinoidea of that Expedition I have figured (p. 24, fig. 1) the apical system of such a specimen. The anal area is seen to be covered already by a considerable number of plates; nothing here points towards the existence of a primordial central plate. The figure is reproduced in Fig. 3.

In the „Panamic Deep Sea Echini“, p. 75, Agassiz says that „we may be justified in assuming that the anal system is in

the Echinothuridæ as in the Cidaridæ covered by five small anal plates". In the young *Phormosoma placenta* the anal plates do not show any trace of five radially placed plates being the first to appear. As seen from the figure the outer circle of larger plates shows a quite irregular arrangement, only one being radial in position. In the quoted place of the „Panamic Deep Sea Echini" Agassiz refers to a figure (Pl. 43, 2) of the apical system of *Phormosoma placenta*, in which „there seem to be five plates in the angles of the anal pentagon somewhat larger than the others". It may perhaps be possible to point out in this figure five larger plates along the outer edge of the anal area, but these are placed off the genital plates, viz. interradially; only at one of the oculars a somewhat larger plate is seen.

Fig. 3. Apical system of a young *Phormosoma placenta*, 3 mm in diameter. $^{28}/_{1}$.

It may thus be stated that the little we know as yet of the development of the Echinothurids is decidedly not in favour of the supposition that either a central plate or five primordial radial plates are present in the young specimens.

The embryological development of the apical system in the Diadematidæ is quite unknown. In the structure of the anal system of the grown specimens there is nothing pointing towards the existence of a primordial central plate. In *Aspidodiadema tonsum* we find five radially placed large anal plates; but since in another species of that genus *(A. Jacobyi)* there are 8 such circumanal plates, placed, of course, without relation to radii or inter-

radii, we can scarcely lay any stress on the case of the radially placed plates of the former.

Among the Arbaciidæ two species, *Arbacia punctulata* and *lixula* have been studied as regards the development from the egg to the young Echinoid, the former by A. Agassiz, Garman & Colton and Fewkes, the latter by Joh. Müller (a. o.) It is, however, only Agassiz, who gives any indications of the development of the anal plates. In the „Revision of Echini“ (p. 733) Agassiz states that he has „traced in the youngest Arbacia raised from the pluteus the first appearance of the anal plates, which appear simultaneously as four lines radiating from the apex and forming the separations of the four anal plates“. This statement seems rather obscure — the plates appearing as lines separating these same plates —, and the figure 68 (p. 734) to which is referred, does not give any real solution of the question. In the „Panamic Deep Sea Echini“ (p. 54—55, Pl. 53—54) some further notes and several admirable figures of the young, postlarval *Arbacia* are given, but the first formation of the anal plates is not shown. In the stage of 2 mm diameter these plates are evidently fully formed already, as appears from the figure 4, Pl. 54, but in the younger stages Agassiz found it „difficult to decide if the anus is covered with four anal plates“. Garman & Colton[1]) give a figure of a young, just metamorphosed *Arbacia*, in which the four anal plates are distinctly seen (Pl. XVIII, fig. 9); but the first appearance of these plates is not described by these authors either. The result is then that the first appearance of the anal plates has not been seen as yet. Another thing is that there can scarcely be any doubt that they really appear contemporaneously as four separate plates, and that a single large suranal plate is never found in the Arbaciids[2]). There is nothing to support the suggestion

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[1]) Some notes on the development of Arbacia punctulata Lam. Studies Biol. Labor. Johns Hopkins Univ. II. 1882.

[2]) H. L. Osborn has figured, in his paper «Variations in the apical plates of Arbacia punctulata from Wood's Holl, Mass». (Science. N. S.

of Lovén (Études p. 75) that „dans les Échinocidaris, il parait que l'ouverture anale se pratique an moyen d'un soulèvement central, par suite duquel le disque, détaché tout autour, se fend en quatre lames triangulaires". But it is very desirable that the first formation of these plates should be really observed.

Regarding the position of the anal plates it is noticeable that in those forms which have normally five anal plates they are placed radially in one form *(Habrocidaris)*, interradially in another *(Pygmæocidaris)*. It is then evident that we find here no support for the suggestion that there were originally five radially placed anal plates, and there is no reason to suppose that „the Arbaciadæ with only four anal plates we may consider as having one of the five radial plates atrophied" (Calamocrinus p. 78).

The periproct of the Cyphosomina is very similar to that of the Echinina, the anal opening lying excentric. Whether a suranal plate is typically present or not cannot be decided from the evidence at hand; the question can scarcely be settled before the development of the recent form, *Glyptocidaris crenularis* A. Ag., has been studied.

The Salenidæ show the central or suranal plate in its full development (Fig. 7, b. p. 43); they afford the main foundation for the homologizing of the Echinoid apical system and the Crinoid calyx, and have, indeed, given rise to the „Crinoid"-theory through the special development of the suranal plate, „die verführerische Subanalplatte", as the Sarasins designate it. A most important feature of this plate is its position outside the anal area.

The embryonal or post-embryonal development is not known

XIII. No. 337. 1901, p. 938), besides specimens with five or three anal plates instead of the normal four. a specimen (fig. 21) in which one of the four anal plates (the left anterior) has increased to a large size, so as to occupy nearly the whole anal area, the other three remaining quite small. The large plate quite resembles a suranal plate and may thus far well be regarded as such. But this abnormal case can certainly not afford the proof that a suranal plate is normally present in the Arbaciids, all other evidences tending to show the opposite.

of any Salenid. A. Agassiz („Blake“ Echini, p. 18) gives some information of the apical system in the young *Salenia varispina* of 1,5 mm diameter; it is stated to be at that size already essentially as in the grown specimens; „the suranal plate is at first quite small, a narrow plate on the side of the anal system opposite the nearest ocular plate. It appears to gain in size at the edges adjoining the genital plates“. The first appearance of the suranal plate has, however, not been observed, the specimen being probably too old already (— the figure, Pl. VI, 1., does not give the apical system sufficiently detailed; the suranal plate is not to be distinguished in it —). The anal system is distinctly pentagonal and covered by eight large, triangular plates with rounded tips. In the young *Salenia miliaris* there are five larger and some small plates along the edge of the anal area. Upon this evidence it seems somewhat rash to conclude that „it appears that the anal system of Salenia, as of Cidaris, was originally covered by five plates“ (A. Agassiz. Panamic Deep Sea Echini. p. 36).

While thus the embryology does not as yet afford the knowledge wanted of the development of the remarkable suranal plate of the Salenids, palæontology seems to have shown us the way in which it has originated. In several species of the genus *Acrosalenia*, there is not one single large suranal plate, but several of different size, so arranged as to diminish in size towards the periproct, as shown in the fig. 4, representing the apical system of a specimen of *Acrosalenia angularis* (Ag.) Desor [1]). It is here scarcely possible to distinguish between the „suranal“ plate and

Fig. 4. Apical system of *Acrosalenia angularis* (after De Loriol).
The genital pores are not indicated in the original figure. At the mark the figure has been slightly restored.

[1]) From P. de Loriol. Premier Supplément à l'Échinologie helvétique. Mém. Soc. Pal. Suisse. XII. 1885. Pl. I. Fig. 4.

the other anal plates, which leads to the conclusion that the „suranal“ plate of *Salenia* is only one of the anal plates which has been specially developed on account of the anal opening having moved to the posterior edge of the anal area, and even encroached upon the posterior genital plate, tending thus towards becoming exocyclic. This suggestion is very much strengthened through the observations of Lambert on the genus *Palæopedina* [1]). In this genus the periproct is „rejeté en arrière par une suranale plus ou moins persistante“ (Fig. 5). In *P. globulus* (Ag.) „le plus souvent la position de la suranale est nettement indiquée par les contours antérieurement anguleux du périprocte; cependant chez certains individus la suranale a été moins développée et elle s'est pour ainsi dire confondue avec les plaques anales dans le cadre irrégulièrement circulaire du périprocte. Il semble donc qu'à l'époque lointaine de l'Hettangien la suranale plus variable n'avait encore acquis la fixité et l'importance qu'elle devait plus tard atteindre dans les Acrosaléniens et les Saléniens“. (Op. cit. p. 26—27).

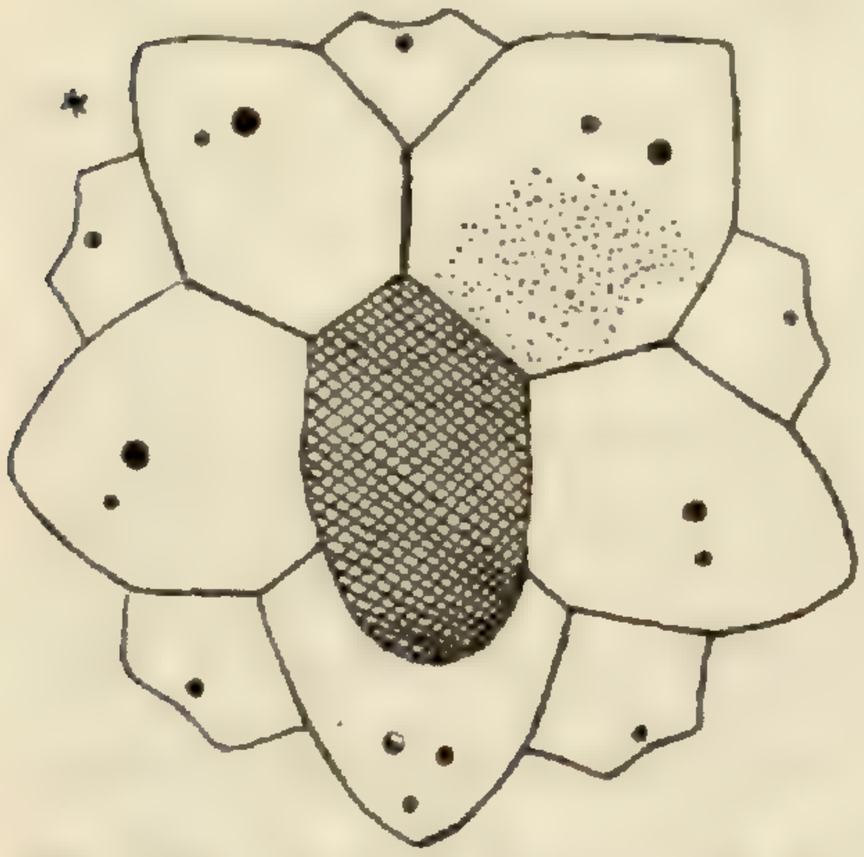

Fig. 5. Apical system of *Palæopedina globulus* (Ag.). Slightly restored at the mark. (From Lambert).

Bather (Triassic Echinoderms of Bakony. 1909, p. 106) modifies this view in so far as he is not inclined to agree that *Palæopedina* has „a form of apex in which the more or less prolonged persistence of the central disc has shifted the periproct to the rear“. „Is it not nearer the truth to say that the passage of the periproct to the rear has involved partial resorption of the posterior genital, while leaving a space to be filled by the increase in size of a periproctal or anal plate, which comes into contact with the growing anterior genitals and so produces angles in the

[1]) J. Lambert. Étude sur quelques Échinides de l'Infra-Lias et du Lias. Bull. Soc. sc. hist. et nat. de l'Yonne. 1899, p. 22.

front border of the periproct? The half formed suranal is not the relic of a pre-existing «disque central»: at least I know of no structure in pre-existing Echinoid genera to which such a term has been or could be applied. If it has any significance it is as *showing the mode of origin of the permanent and fully formed sur-anal in the Saleniidae*[1]). In itself it can hardly be the forerunner of the Saleniid sur-anal", since *Palæopedina* cannot be regarded as an ancestor of the Salenids. I fully agree with Dr. Bather in this view of the origin of the suranal plate of the Salenids. To regard the suranal plate as a case of atavism — „one of those cases of the sudden reappearance of an ancient structural feature after a long period of time" — as suggested by Agassiz („Blake" Echini p. 16) there is nothing to support. Likewise there are no facts to support a supposition that the suranal plate may have originated through a fusion of the anal plates, as seems to be expressed by the Sarasins when saying: „Die Analplatten der Saleniden haben also die Tendenz zu verschmelzen" (Über die Anatomie der Echinothuriden und die Phylogenie der Echinodermen. Ergebn. naturw. Forschungen auf Ceylon. I. 1887—88, p. 150).

Some words may here be said of the genus *Gauthieria* Lambert. The remarkable apical system of this genus (Fig. 6) is described by Lambert[2]) (Op. cit. p. 4) as consisting of «1^0 Une plaque centrale hexagonale; 2^0 Trois plaques secondaires antérieures, hexagonales; 3^0 Des plaques suranales variées, au nombre probable de huit» — besides, of course, the usual number of genital and ocular plates. Lambert lays great stress on this central plate. «Cette plaque centrale hexagonale tout à fait par-

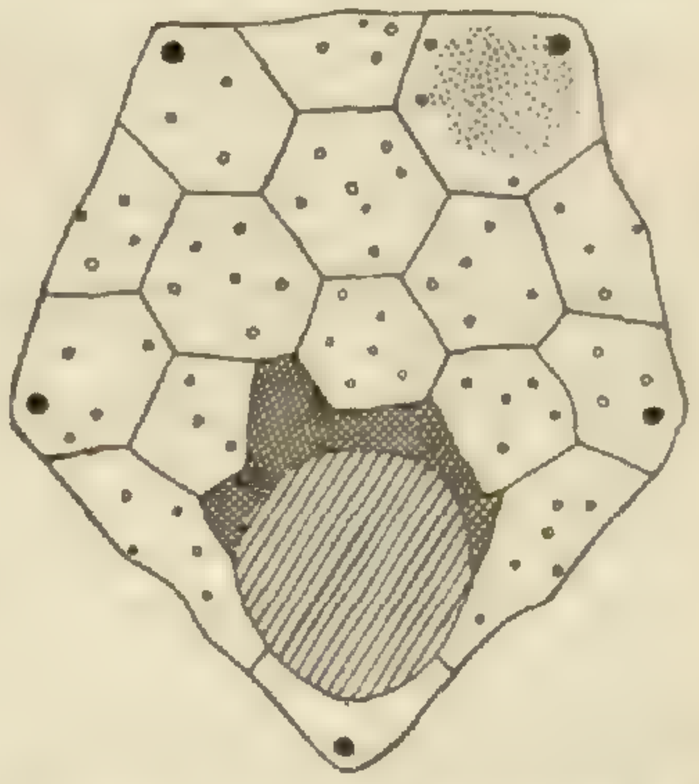

Fig. 6. Apical system of *Gauthieria radiata*. (From Lambert).

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[1]) The italics are mine.

[2]) J. Lambert. Note sur un nouveau genre d'Échinide de la Craie de l'Yonne. Bull. Soc. sci. hist. & nat. de l'Yonne. 1888.

ticulière au *C(yphosoma) radiatum* (type of the genus *Gauthieria*) et à quelques Acrosalénies est bien différente de la plaque unique pentagonale, dite suranale, des Peltastes, des Salénies et des Acrosalénies typiques. La plaque pentagonale de ceux-ci semble, chez un Échinide, une forme primitive, tandis que l'hexagone central du *C. radiatum* est probablement une forme dérivée, dont la morphologie n'apparait pas clairement». — It seems to me that there is no reason to regard this hexagonal plate in the middle of the apical system of *Gauthieria* as having a special morphological value. As Lambert himself has pointed out (Op. cit. p. 6) a similar plate occurs in some species of *Acrosalenia*, more or less distinctly developed. But the aspect of only a single specimen like that represented in fig. 4 seems to me to leave no doubt that this middle plate is simply one of the anal plates, of the same morphological value as the other anal plates, larger or smaller[1]).

The systematical position of the genus *Gauthieria* is not without importance as regards the remarkable development of its anal system. In the paper quoted Lambert is inclined to regard it as nearest to *Acrosalenia*, representing „un type à part qui relie les Salénies et les Peltastes aux Cyphosomes“. Later on, in the „Note sur quelques Échinides Éocènes de l'Aude“ (Bull. Soc. Géol. de France. 3 Sér. XXV. 1897, p. 498) it is referred to the Cyphosominæ. — I do not venture to express a personal opinion of which is its true systematic position; I would only point out that, in case it has nothing to do with the Salenids, this means that the special character of its anal plates has been reached along its own line of development, which fact, combined

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[1]) A. Agassiz (Panamic Deep Sea Echini, p. 40) remarks that „the only thing which at all suggests such a structure in recent Echini is the anal system of Aspidodiadema and Dermatodiadema“. I cannot see any similarity in the structure of the anal system of *Gauthieria* and of the two genera named. In the latter the anal opening is central, the large, disconnected anal plates lying concentric round it, while in *Gauthieria* the anal opening is excentric, the large plates lying at one side of it.

with the beginning development of a distinct suranal plate in *Palæopedina*, indicates that the „suranal“ plate may have been acquired separately by different forms of Echinoids. In the light of this supposition it will be especially interesting to study the suranal plate of the Echinina.

The existence of a suranal plate in this great division of the Echinoids was first pointed out by A. Agassiz[1]), later on by Lovén (Études, p. 74—75. Pl. XXI) for *Strongylocentrotus drøbachiensis*. It has played an important part in the question about the homologies of the apical system, Lovén finding in this fact a direct proof of the correctness of his view of the homology between the Crinoid calyx and the Echinoid apical system. The

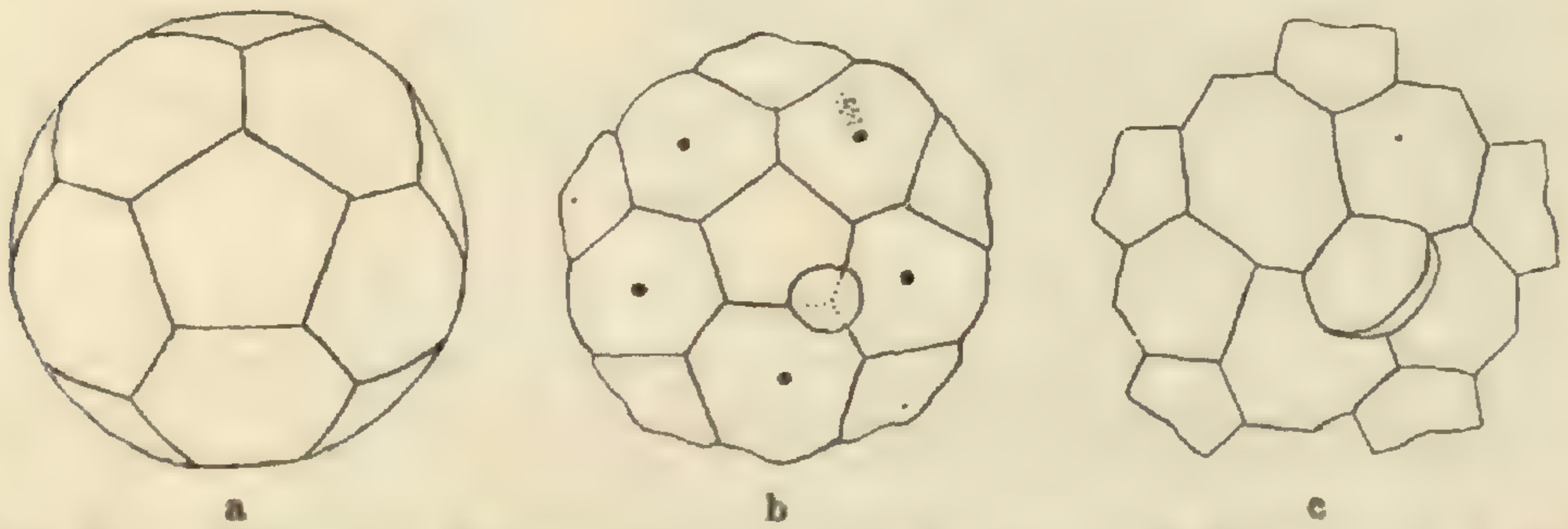

Fig. 7. a. Calyx of *Marsupites*, b. Apical system of *Salenia*, c. Apical system of a young *Strongylocentrotus drøbachiensis*. (Slightly altered, from Lovén).

three figures (Fig. 7) here copied from Pl. XXI, of Lovén's „Études“, representing the calyx of *Marsupites*, the apical system of *Salenia* and of the young *Strongylocentrotus* make this easily understood; even the peculiar striping of the plates (omitted in the figure) is the same in all of them.

The existence of this plate in general in the Echinina may be regarded as an established fact, even if only few species have been described or figured in quite young stages as e. g. *Parechinus microtuberculatus* by Bury in his „Studies on the Embryology of Echinoderms“[2]), or *Sterechinus Neumayeri* in the author's work „Die Echinoiden der Deutschen Südpolar-Expedition“, Taf. XVII.

[1]) On the Embryology of Echinoderms. Mem. Amer. Acad. IX. 1864, p. 12.
[2]) Quarterly Journ. Micr. Sci. N. S. 39. 1889. Pl. XXXVIII. Fig. 12.

Fig. 27). Generally the grown specimens retain distinct traces of the primordial large suranal plate, and sometimes it is retained also in the grown specimens as a very large plate, covering nearly the whole anal area, as e. g. in *Genocidaris maculata* A. Ag., *Pleurechinus Scillæ* (Mazzetti); in the latter species some specimens even have, upon the whole, no other anal plates developed besides the suranal plate [1]). In remarkable contradistinction to this species another species of the same genus, *Pleurechinus Döderleini* Mrtsn., has the whole anal area covered by numerous small plates, among which no trace of a suranal plate can be detected [2]). A very similar case is afforded by *Prionechinus Chuni* Döderlein; however, Döderlein thinks he can distinguish a slightly larger plate near the edge of the anal area, which may represent the suranal plate [3]). In any case it would be very interesting to examine quite young stages of these species in order to state, whether a suranal plate is originally present here or not. The same would apply to *Parasalenia* with its peculiar four anal plates, recalling the condition in *Arbacia*.

Some observations on the development of the apical plates in the young embryo of *Parechinus microtuberculatus* are given by Bury in his papers „Studies in the Embryology of Echinoderms“ and „The Metamorphosis of Echinoderms“ [4]), Though the first appearance of the suranal plate is not shown, still the important fact is to be derived from his observations that the suranal plate

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[1]) It no longer holds good then that „there is no Echinoid known .... in which in the adult a single plate covers the anal system“, as is maintained by Agassiz against the Sarasins (Calamocrinus, p. 79, Note).

[2]) Th. Mortensen. Siam-Echinoidea I. Tab. II. Fig. 1.

[3]) Die Echinoiden d. deutschen Tiefsee-Expedition, p. 192. Taf. XXIV. Fig. 3.

[4]) Quarterly Journ. Micr. Sc. N. S. Vol. 29. 1889, p. 33—35. Pl. 38. Figs. 10—12. Vol. 38. 1895, p. 78—80. Pl. 7. Fig. 34. Pl. 8, figs. 36—38. The observations of Joh. Müller and A. Agassiz are not sufficiently detailed for the present purpose as regards the development of the apical system.

appears much later than the genital and ocular plates, in accordance with what has been found in the other Echinoids thus far examined. — In the „Ingolf"-Echinoidea I, p. 89, Pl. VII. Figs. 6—8. II, p. 172, I have given some information on the development of the skeletal plates in *Hypsiechinus coronatus* Mrtsn. Concerning the suranal plate it is stated that in the more advanced stages „only one large anal plate is found (Pl. VII. Fig. 14), which may be perforated by a larger opening; accordingly it seems quite to encompass the anal aperture". This statement is incorrect. I have reexamined my preparations and find that in the stage represented in Pl. VII. Fig. 6 the central plate has not yet appeared. In the stage represented by Pl. VII. Fig. 8 the central plate has made its appearance as a small plate occupying the middle of the space enclosed by the large genital plates. (Fig. 8). There is no larger hole in the central plate, which might be supposed to represent the future place of the anal opening. The plate figured in Pl. VII, fig. 15 of the work quoted is evidently the madreporic plate; the misconception is due to the fact that the specimen from which it has been figured has been placed in an oblique position, so that this plate apparently occupied the centre of the apical system.

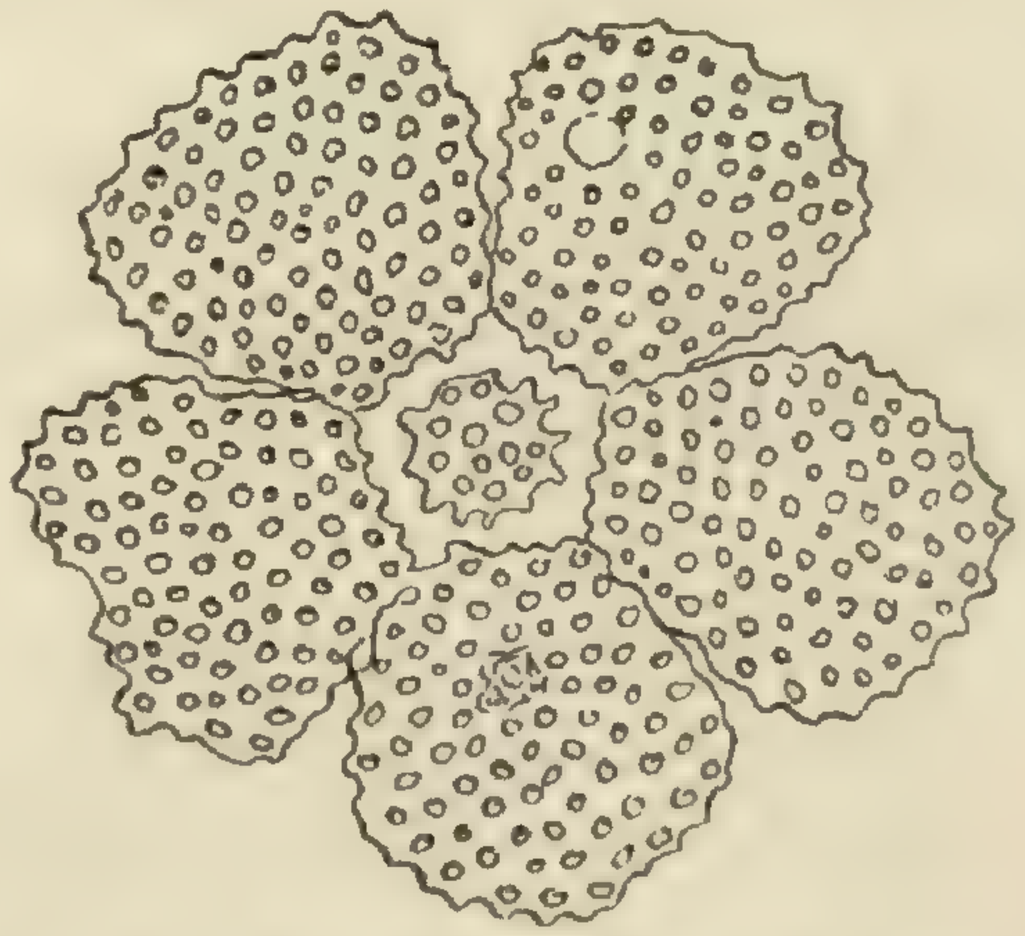

Fig. 8. Apical system of a young *Hypsiechinus coronatus*.
The five large plates represent the genital plates; the ocular plates have been omitted, being not in contact as yet with the genital plates. $^{110}/_{1}$.

The Echinina do not lend any support for the suggestion of Agassiz, that there were originally five radially placed anal plates. It is true that *Pleurechinus bothryoides* has five larger radial anal plates among a larger number of smaller ones; but this single case, evidently, cannot be of much value against the evidence afforded by all the rest of this numerous group — especially

so long as we do not know whether this is a constant feature in the species, or whether the same condition is found in the young specimens (which is scarcely probable [1]).

Agassiz (Panamic Deep Sea Echini, p. 39) has pointed out the marked difference between the suranal plate of the Echinina and that of the Salenids, the former being inside the anal area, while in the Salenids it „never becomes part of the anal system proper". In spite of this difference he evidently still regards these plates as homologous, as it is expressed in „Calamocrinus" (p. 79): „we are undoubtedly justified in considering the single anal plate of the young of such Echini as Strongylocentrotus .... as homologous with the single large anal plate of the Salenidæ". This homology has, however, been disputed by Lambert (Note sur un nouveau genre d'Échinide de la Craie de l'Yonne. 1888, p. 9. Note). „Ce que l'on doit avant tout considérer, c'est la forme du bord interne dans les plaques normales solides de l'apex (génitales et ocellaires). Les bords de ces plaques sont-ils arrondis, de manière à former le cadre irrégulièrement circulaire d'un espace central, je dis qu'alors il n'y a pas de véritables suranales .... Mais les ocellaires et les génitales circonscrivent-elles un espace central à bords irréguliers avec angles plus ou moins saillants et rentrants, il est évident qu'elles ne formaient pas seules le cadre du périprocte et qu'elles devaient admettre des plaques complémentaires plus ou moins persistantes, s'intercalant dans ces angles et constitutives de l'apex. Il y a entre ces plaques apicales et les plaquettes anales .... une différence fondamentale .... Les prémières sont constitutives du disque central; les autres, malgré une dérivation originelle, purement adventices, appartiennent plutôt au périprocte". I am not aware that Lambert has later on corrected this view. But the apical system of *Palæopedina* and

[1] De Meijere (Siboga-Echinoidea, p. 78) states that the young *Pleurechinus bothryoides* has only a single anal plate. The young specimens, on which this statement is founded, are, however, not *Pl. bothryoides*, but some other species of the genus *Pleurechinus*. (Op. cit. p. 202. Siam-Echinoidea. I, p. 81, 84).

Acrosalenia show beyond doubt, so it seems to me, that the suranal plate of *Salenia* is only a special development of one of the anal plates, and thus there can be no essential morphological difference between it and the suranal plate of the Echinina, which is likewise only one of the anal plates specially developed [1]).

The question whether the suranal plate of the Echinina is a direct inheritance from the Salenids naturally arises here. This has been maintained by the Sarasins. „Der Apex der jungen Echiniden ist, insofern er die Subanalplatte aufweist, nicht ein „Crinoidenfantom", sondern ein Salenidenbild, d. h. diejenigen Echiniden, welche in der Jugend ihr Analfeld von einer einzigen oder von einer ganz geringen Zahl relativ grosser Platten bedeckt zeigen, durchlaufen ein Salenidenstadium, sie stammen also von den Saleniden ab. . . . . Wir gehen daher so weit die Echinothuriden, Cidariden, Diadematiden und alle diejenigen Formen, welche in ihrer Jugend die Subanalplatte nicht aufweisen, als Präsaleniden zu bezeichnen. Dann folgt das Geschlecht der Saleniden, in dessen Stammesgeschichte sich die so verführerische Subanalplatte langsam herausbildete, und endlich bezeichnen wir alle jene jüngsten Descendenten, welche in ihrer Jugend den Saleniden-Stempel tragen,

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[1]) After this paper had gone to press I received from M. Lambert a letter in which he gives the following statement concerning this question, which I quote here, with his permission: „Je n'ai pas dit dans ma note sur le genre *Gauthieria* que les plaques anales des Echiniens étaient morphologiquement différentes de la suranale des Salénies. J'ai toujours pensé le contraire et partagé à ce sujèt les idées de Lovén; mais j'ai tenu à bien faire ressortir la différence considérable existant entre des plaques ayant conservé leur caractère originel et restant partie intégrante de l'apex (les suranales des Saléniens) et les plaques qui ont subi une adaptation nouvelle en se développant seulement dans le cadre subcirculaire du périprocte et sont toutes affectées à l'appareil anal (plaques des *Hemicidaris* et des Echiniens).

Malgré cette adaptation à un organe particulier j'ai toujours pensé que les plaques anales des réguliers étaient morphologiquement représentatives du disque central des Saléniens".

As appears from this paper, my view of the question, which condition of the apical system should be regarded as the primitive and which as a new adaption, is directly the contrary of that held by M. Lambert.

als Salenigonen, indem wir sie für Descendenten der Saleniden halten". (Über die Anat. d. Echinothuriden u. die Phylogenie d. Echinodermen, p. 150). This does not appear quite so convincing as the Sarasins seem to think. I would especially emphasize the difference, already pointed out by Agassiz (cf. p. 46), that in the Salenids the suranal plate is outside the periproct, while in the Echinina it remains within the periproct. This fact undoubtedly leads to the conclusion that the suranal plate of the Salenids represents the more specialized condition; but the more primitive condition cannot be derived from the more specialized. The same may apply to the periproct itself. In the Echinina it is central, though sometimes with a slight tendency towards becoming excentric in the direction of the ocular I and genital I, as indicated by the fact that the ocular I is generally the first to come into contact with the periproct. Also the anal opening has a — still more — distinct tendency towards becoming excentric in the same direction. This is carried to an extreme, both as regards the periproct and the anal opening, in the genus *Gymnechinus* (Fig. 9). — In the Salenids the periproct is excentric; in the recent forms the excentricity is in the same direction as in those of the Echinina, where an excentricity can be observed at all; but in the older forms it is excentric in the direction of the posterior interambulacrum (genital 5). This also is against the derivation of the Echinina from the Salenids. It therefore seems most probable that the suranal plate of the Echinina is a feature acquired separately by this group of Echinoids. There may thus far be reason to distinguish between this plate in the two groups, and I would suggest that the plate of the Salenids be termed the central plate, that of the Echinina the suranal plate. This distinction

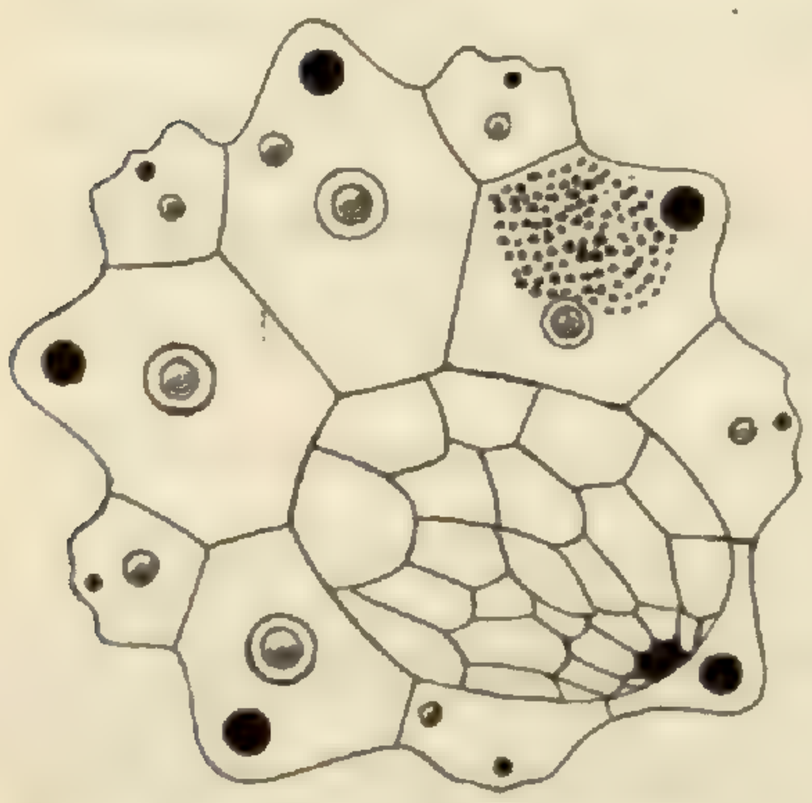

Fig. 9. Apical system of *Gymnechinus pulchellus*. (From Th. Mortensen. Siam-Echinoidea. I. Pl. II. Fig. 11).

may be practical, but it should be remembered that it is not a very essential distinction. — I shall not here enter otherwise on the question of the ancestry of the Echinina.

Turning now to the „Irregularia", we must first make it clear, where we shall have to seek for the central or suranal plate. Lovén sought it in the apical system (the madreporite), while Agassiz (Calamocrinus p. 82—83) sought it among the plates of the periproct. Both of these eminent authors are evidently so far right, as the Irregularia may be supposed to have been derived either from such forms as the Salenids, in which the suranal plate is no longer part of the periproct, or from such forms in which the suranal plate is not at all developed, or in any case remains within the periproct. We may then seek for a central or suranal plate in the Irregularia either among the plates of the apical system or among those of the periproct.

The Holectypoidea. Lovén (Études, p. 81) considers these forms as having a distinct central plate; but the figures he gives of the apical system of Holectypoids show that it is only the madreporic plate (genital 2) which is sometimes considerably widened, as in *Pygaster dilatatus* (fig. 9, p. 80), so as to occupy the middle space of the apical system. In others (*Holectypus depressus* Cott., *Discoidea conica* Desor, Pl. XV. Figs. 132—133) this plate is scarcely larger than the other genitals (Fig. 10). It was probably the explanation of the large madreporic plate of the ethmolytic Amphisternata as a compound plate, homologous to the genital 2 + the central plate + the genital 5, which induced Lovén to regard also the madreporic plate of the Holectypoidea as a compound plate, homologous to the genital 2 + the central plate. That this explanation of the madreporic plate in the Amphisternata is wrong, will be shown below; that it is no more natural for the Holectypoidea, seems evident from an unprejudiced inspection of the figure of *Discoidea*

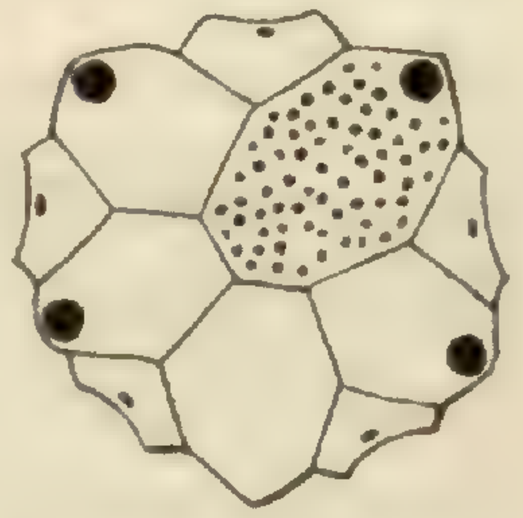

Fig. 10. Apical system of *Discoidea conica* Des. (From Lovén).

K. Bot. Gard.
1912

conica here reproduced (Fig. 10). The only natural explanation is, that it is the madreporic plate which may be more or less widened towards the middle of the apical system. Of a central plate there is no trace in the apical system. In the anal system there seems to be no distinct suranal plate either, so far as evidence goes from the little we know of the plates covering the periproct in this group of fossil Echinoids. — Lambert in the paper „Sur un *Discoïdes inferus* (Desor) recueilli à Tancarville (Seine-Inférieure) (R. Fortin. Notes de Géologie Normande. VI. Bull. Soc. géol. Normand. XVIII, p. 20—22) certainly names the two small plates in the middle of the periproct (Fig. 11) the central plates (sometimes there is only one such plate). But it is evident that this „central" plate is not the homologue of the central or suranal plate of Salenids and Echinids; it is simply a small periproctal plate, though scarcely originating through „la fissiparité des valvulaires contiguës" (those plates surrounding the anal opening), as suggested by Lambert. If any homologue to the suranal plate were to be found here, it could only be the large one at the upper end of the periproct, the „opercular" of Lambert; but as this plate is stated by Lambert to be sometimes wanting, it is evident that no special morphological value can be ascribed to this plate either. — The conclusion that the Holectypoidea have no central or suranal plate is perfectly in accordance with their close relation to and undoubted descent from the Diadematoidea, which likewise lack the suranal plate.

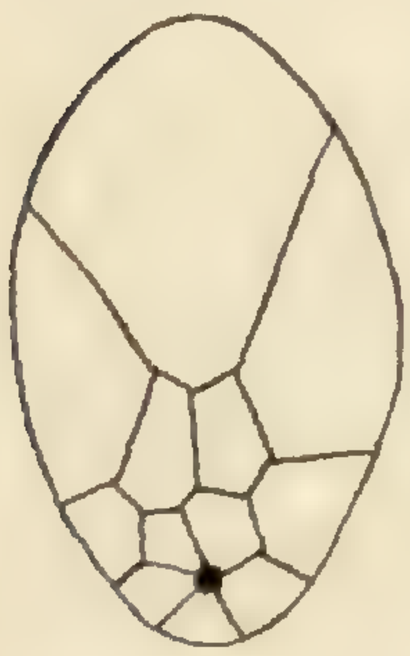

Fig. 11. Anal system of *Discoidea infera*. (After Lambert).

In the Clypeastroidea the plates of the apical system are so completely coalesced that it is quite impossible to state anything about the presence or lacking of a central plate from the examination of the grown specimens. The study of the development of the plates can alone give the clue to the question whether there

is a central plate or not in the Clypeastroids. Three species have been studied as regards their development, viz. *Echinocyamus pusillus*, by Théel, *Echinarachnius parma*, by Fewkes, and *Mellita testudinata*, by Caswell Grave; the latter author, however, does not give any information of the development of the apical system [1]).

In the young *Echinocyamus* the whole apical side is covered by a single large plate, in which the water-pore is situated. (Pl. IX. Fig. 107 of Théel's work „On the development of Echinocyamus pusillus"). This plate originates in a most remarkable way from the dorsal rod of the larval skeleton (Pl. VIII. Figs. 103—104, p. 57). There is nothing in this remarkable development to prove that this is a real central plate, homologous to the central plate of *Salenia*. The development of the plates of the anal membrane is not described by Théel. I have examined some young specimens of 1,5—2 mm length as to this and find there a circle of nearly equal sized plates, among which a larger suranal plate cannot be pointed out.

In *Echinarachnius parma* the matter would seem to be very different. Fewkes (Preliminary Observations on the Development of Ophiopholis and Echinarachnius [2]) ascertains (p. 141) the existence of a „central plate, „centrale", of pentagonal outline, around which are arranged a ring of five plates, closely fitting to the central plate". The figure to which Fewkes refers (Pl. VII. Fig. 16) seems, however, to show beyond doubt that his interpretation is wrong. What he designates as the central plate is certainly of pentagonal outline, but there is no trace of calcareous network seen therein, and since he otherwise describes and figures the calcareous network very carefully there has evidently been nothing of the kind in this space. In the figure 11, Pl. VIII, are shown „a central and five peripheral plates in the (its) apical region", which

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[1]) Some points in the structure and development of Mellita testudinata. Johns Hopkins Univ. Circ. No. 157. (Vol. XXI). 1902.

[2]) Bull. Mus. Comp. Zool. XII. 1886.

might look like a central plate and five genital plates. This figure, however, is so crude that it must seem quite unreasonable to conclude anything from it regarding the development of the apical system in *Echinarachnius*.

The development of the plates covering the anal area is not described by Fewkes. But Agassiz has shown that the anal area is covered by a single large plate in the young *Echinarachnius* (Revision of Echini. Pl. XII, fig. 11), so that there would appear to be a suranal plate developed here.

The Meridosternata do not show any trace of a central plate in the apical system, and likewise there is no trace of a larger suranal plate among the plates of the periproct. Any indication of the original condition being the existence of five radially placed anal plates is not seen either. It is true, that we know only the condition in the grown specimens. But there is no reason at all to suggest that the young postembryonal stages might possess a central or suranal plate. A young specimen of *Urechinus naresianus* of only 3 mm length („Ingolf" Echinoidea II, p. 39—40) — the youngest specimen known of any of the Meridosternata — has its periproct covered with an outer circle of larger plates and some small inner ones (Fig. 12). There is nothing in this structure pointing towards the existence of primordial suranal plate.

Fig. 12. Anal system of a young *Urechinus naresianus*, of 3 mm length. $^{33}/_{1}$.

In the Amphisternata, on the other hand, a central plate is supposed by Lovén to exist in those with an ethmolytic apical system, the great madreporic plate being regarded as homologous to the genital 2 + the central disk + the genital 5, which are all soldered together, the sutures having become lost. — (Études p. 83; Pourtalesia p. 71). It must be said that this interpretation of the large madreporic plate in the ethmolytic Amphisternata does not beforehand seem very probable. The most

natural thing would be to regard it as representing the genital 2 alone, homologous to the madreporic plate of the ethmophract Amphisternata, and of the Echinoids in general, only grown excessively (Fig. 13). That this is the correct view, is shown by the development of the plates of the apical and anal system. This development has been studied by Lovén, A. Agassiz and the present author, especially in *Abatus cavernosus* (and *cordatus*). In my work „The Echinoidea of the Swedish Southpolar Expedition“ [1]) (p. 75—78) the development of the apical system of *Abatus cavernosus* is treated at some length. It is shown that there is no central or suranal plate developed (cf. Pl. XVII, fig. 9); on the other hand a distinct genital 5 is developed at the hind edge of the anal area. (Fig. 14). It is thus made certain that Lovén's view of the madreporite representing the genital 2 + the central plate + the genital 5 cannot be maintained. Also in *Amphipneustes Koehleri* Mrtsn. the same holds good, as shown by the young stage figured in Pl. XVIII, fig. 2 of the work quoted. In the light of the facts thus made known regarding the development of the apical system in *Abatus cavernosus*, the young stages of *Echinocardium flavescens*, *Brisaster fragilis*, *Hemiaster expergitus* figured by Lovén (On Pourtalesia. Pl. XV. Fig. 173) and by the present author („Ingolf“-Echinoidea. II, p. 98, fig. 17. Pl. XIII. Fig. 2), though already

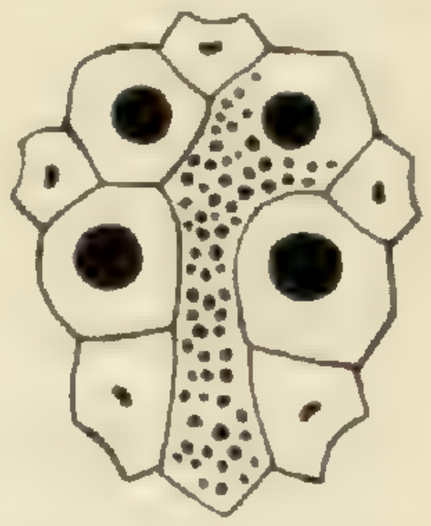

Fig. 13. Apical system of *Macropneustes Pellati* Cott. (From Lovén).

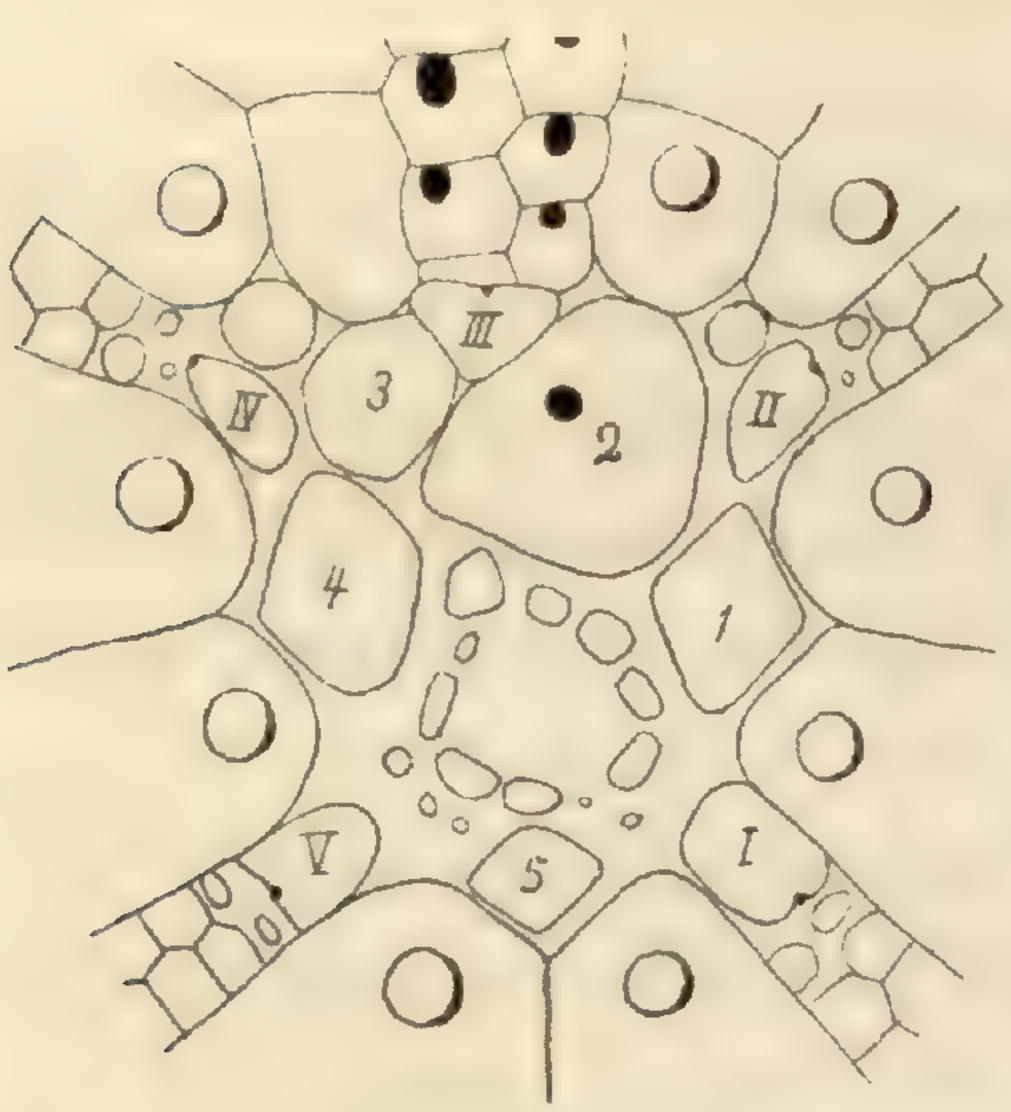

Fig. 14. Apical system and surroundings of a young *Abatus cavernosus*. The plates numbered 1, 2 . . .5 are the genitals, those numbered I, II—V the oculars. (From. Th. Mortensen).

[1]) Schwedische Südpolar-Expedition. Bd. VI. 4. 1910.

too advanced for showing the first formation of the apical system, do not leave any doubt that also in these forms a central or suranal plate is not developed. It may then fairly be concluded that in the Amphisternata, upon the whole, there is no central or suranal plate[1]). Likewise it is evident that there is no indication of the periproct being originally covered by five radially placed anal plates („infrabasalia").

One group is still left, viz. the Cassiduloidea. Here the apical system shows the most interesting feature, that — in some forms at least (*Galeropygus*, *Hyboclypeus*, *Clypeus*, *Pyrina* a. o.) — there is one or more small plates included by the apical plates (Fig. 15). Lovén (Études, p. 82) explains this as a division of the central plate and establishes as a general rule that „toutes les fois que le disque se trouve divisé, le madréporite est limité à la costale 2, tandis que, quand le disque est entier, le madréporite s'y établit". It is certainly a much more natural explanation that the plate containing the madreporite is the genital 2, even if it is widened so much as to occupy the whole middle space of the apical system or even more, and the small plate (or plates) appearing behind the madreporite are not parts divided off from the central plate, but represent the central plate itself. Thus the Cassiduloidea have a real central plate and, indeed, so strikingly recall the Salenids herein, that the suggestion lies at hand that they are developed as a separate branch from the Salenids, being without any nearer relation to the other „Irregular" Echinoids. I may here also point out two other important facts

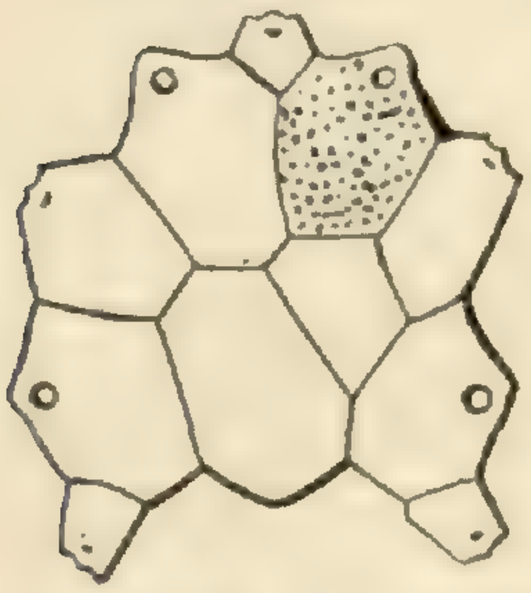

Fig. 15. Apical system of *Galeropygus marconi* Des. (From Lovén).

[1]) In the Echinoidea of the Swedish Southpolar Exped. p. 98 is mentioned a specimen of *Amphipneustes Koehleri*, in which the madreporite is abnormally divided, so that we find a separate plate in the middle of the apical system; there is, however, no doubt that this is an abnormality, and this case cannot be taken as a proof of the existence of a central plate in the Amphisternata.

which are in accordance with this derivation. The tubercles of the Cassiduloidea are imperforate, as in the Salenids, while in the other „Irregularia“ they are perforate. The other fact relates to the very important discovery recorded by A. Agassiz[1]) that the young *Echinoneus* has teeth and a lantern, which are again resorbed in the course of the development. As seen by the figures of the paper quoted (Pl. II, figs. 6 and 7) the teeth are keeled, as in the Salenids, while in the Diadematids the teeth are unkeeled. Perhaps still more facts speak for this derivation of the Cassiduloidea; but as I have not yet studied this group of Echinoids more closely, I will not at present enter on a more detailed discussion of this question.

Agassiz has suggested (Calamocrinus, p. 82) that the anal system of *Echinoneus* may originally have been covered by a single large suranal plate, as he has found it in *Echinarachnius*. This is highly improbable, for several reasons. The anal area of the grown specimens do not show the slightest trace of such a plate. Further it is scarcely possible that both a central plate in the apical system and a suranal plate in the anal area could be present in any Echinoid. Now, it is true, a central plate is not found in the apical system in any of the recent Cassiduloids; but in view of the fact that this plate occurs in the older forms the suggestion lies near that it will prove to exist in the young of the recent forms. In any case the study of the development of the apical and anal system of the Cassiduloids will be of unusually great interest.

Having thus revised the question of the existence of a suranal or central plate in the different groups of Echinoids, we may summarize the results as follows:

A central or suranal plate has not been found in the Palæechinoidea, the Cidaroidea, Diadematoidea, Echinothuridæ, Arbaciidæ, Holectypoidea, the Meridosternata or Amphisternata, while its existence

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[1]) On the existence of teeth and of a lantern in the genus Echinoneus Van Phels. Amer. Journ. Sci. XXVIII. 1909, p. 490.

in the Clypeastroidea is still uncertain (*Echinarachnius*!). Only in the Acrosalenidæ, the Salenidæ, the Echinina and the Cassiduloidea is it typically present.

It seems very probable that the central (suranal) plate has developed separately along different lines; thus the suranal plate of the Echinina can scarcely be derived from the central plate of the Salenids, while on the other hand the central plate of the Cassiduloids may probably be derived from that of the Salenids, thus indicating a different origin of this group from that of the other Irregularia, which evidently have been derived from the Diadematoidea through the Holectypoidea.

There is no evidence to support the theory that the anal area of the Echinoids was originally covered by five radial anal plates („infrabasalia“). The primary condition is, according to all evidence, an indefinite number of plates arranged more or less in circles, but without any relation to the radii or interradii. The suranal plate of the Echinina, the central plate of Salenids, the four anal plates of *Arbacia* etc. probably all originated through special growth of some of the anal plates, these plates being thus all of the same morphological value.

The central plate can by no means be regarded as forming an essential part of Echinoid morphology, being not a primitive, but a special feature, acquired separately in some of the more specialised groups, while it is not found in any of the more primitive groups. Accordingly „we are no longer justified in looking upon this kind of anal system with a single plate as the earliest type“ (Agassiz. Calamocrinus, p. 79). — I may quote the following passage from Neumayr[1]): „So ergibt sich, dass alle geologisch alten Formen in der entschiedensten Weise gegen die Auffassung sprechen, dass eine Apexentwicklung, wie sie bei *Salenia* persistirt, als typisch für die ganze Abtheilung der Seeigel betrachtet werden könne ....

[1]) Morphologische Studien über fossilen Echinodermen. Sitz. Ber. Kais. Akad. d. Wiss. Wien. Bd. 84. I. 1882, p. 152.

Damit fällt auch der Boden für die Detailparallelisirung einzelner Plattengruppen am Echinidenscheitel und Crinoidenkelch und damit überhaupt jede nahe Homologie zwischen Crinoiden und Seeigeln weg; vom palæontologischen Standpunkt liegt kein Anhaltspunkt für die Annahme einer engen Beziehung zwischen beiden Classen vor, sie erscheinen im Gegentheil als die äussersten Extreme im ganzen Formengebiet der fossil näher bekannten Echinodermen".

Upon the whole, the necessary condition for tracing a homology between the apical system of Echinoids and the calycinal system of Crinoids must be the existence of this configuration of plates in the supposed common ancestor of Crinoids and Echinoids, and the same, of course, holds goods for the alleged homology of the Crinoid calyx with the apical plates of Asteroids and Ophiurids. But these plates were not thus developed in the forms from which we must suppose that the Crinoids on one side and the Echinoids, Asteroids and Ophiurids on the other side have originated. I may quote from Dr. Bather[1]) the following passage: „What is fatal (to the theory of the homology between these plates) is the conclusion to which the evidence of fossils forces us — that the free Echinoderms, if they arose from stalked forms at all, indubitably did so ages before a calycinal system had been evolved . . . . If, however, it be impossible to regard the apical systems of Echinoidea and Asteroidea as homogenetic with that of Crinoidea, there can be no objection to the statement that similar plates are developed in a similar position with regard to the fundamental anatomy, under the influence of somewhat similar causes". — With this I fully agree.

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[1]) A Treatise on Zoology. Ed. by E. Ray Lankester. Part. III Echinoderms, p. 14.

IV. On natural hybrids of Echinoderms.

For a long time the Echinoderms, and especially the Echinoids, have been the favourite objects of artificial hybridisation. In many cases the larvæ have been reared to the pluteus-stage, but only in few cases have the hybrid larvæ been reared as far as metamorphosis and never to fullgrown animals. L. Doncaster[1]) has reared artificial hybrids of *Paracentrotus lividus* and *Parechinus microtuberculatus* up to metamorphosis, and in a recently published paper: „On the artificial culture of marine Plankton Organisms“ by E. I. Allen and E. W. Nelson[2]) it is recorded that Mr. W. De Morgan has succeeded in rearing artificial hybrids of *Echinus esculentus* and *acutus* until metamorphosis; „in all thirty young hybrids were obtained and a number of them are still alive and feeding on red weeds“. — Herewith a most important step forwards has been made; the next great step will be to rear the hybrids until maturity. — Hitherto it is, however, only the hybrid larvæ which have been studied. But these do not give any contribution to the solution of several important problems relating to hybrids, e. g. the inheritance in the hybrids of the characters peculiar to the grown individuals of the parent species, or whether they become sexually ripe or not etc. This, of course, confines the value of such experiments within much narrower limits than would be the case, if the hybrids were reared to fullgrown animals. It is certainly also a fact of rather great importance that the fullgrown animals of the parent species afford several more characters, and generally much more important and definite, than do the corresponding larvæ. This will make it much more easy to follow the fate of the different characters of the two parent species in the hybrids, than is the case, when only the hybrid larvæ are studied. With the

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[1]) L. Doncaster: On rearing the later stages of Echinoid larvæ. Proc. Cambridge Philos. Soc. XII. 1902, p. 47—49.

[2]) Quart. Journ. Micr. Sc. N. S. Vol. 55. 1910.

greatest expectations we may then look forwards to the future study of artificial hybrids of Echinoderms, now that a comparatively easy method of rearing such hybrids to past metamorphosis has been worked out. — To rear them alone to metamorphosis will, however, not be enough. The specific characters are not developed as yet in the just metamorphosed Echinoderms, only in the grown specimens are the characters fully developed. The end, therefore, is not gained before the hybrids are reared to maturity.

While the artificial hybrids, the larvæ, have been the object of very extensive and most important research, the question, whether there may possibly be found natural hybrids of Echinoderms has received very little attention as yet. How little was known hereof, appears from the fact that Doncaster (Op. cit. p. 49) writes, after having mentioned that it is possible in certain cases to rear hybrid larvæ beyond metamorphosis and so to obtain hybrid urchins: „this raises the further question of why such hybrids do not occur in nature“. In fact, not a single case of natural hybrids of Echinoderms was known at that time, though a few suggestions as to their existence had been set forth (Agassiz, Bell.). This, however, cannot be wondered at. The necessary condition for recognizing specimens as being hybrids must be both a thorough knowledge of the specific characters of the different species and of the fauna of the locality from where the specimens in question have come. So long as we do not know the fauna of such locality so exactly that we can say with certainty that a specimen with a hitherto unknown combination of characters cannot possibly represent a new species, we cannot have full certainty for its being a hybrid. Especially the latter condition has still been fulfilled for few cases only; but also the more thorough knowledge of the specific characters of the different species is of comparatively recent date, in any case as regards the Echinoids, which especially concern us here. It is then only what might be expected that the

few cases reported of supposed natural hybrids of Echinoderms are of quite recent date.

The first allusion to the possible existence of natural hybrids of Echinoderms was made by A. Agassiz. In his „Note sur la fertilisation artificielle de deux espèces d'étoiles de mer“ (Arch. Zool. expér. & génér. III. 1874, p. XLVI) he says he found several specimens of *Asterias berylinus* and *pallidus* (of which two species he succeeded in rearing hybrids „jusq'au commencement de la formation de l'étoile sur le tube aquifère de la Brachiolaire“) which had no sexual products developed at the season when these species normally have ripe sexual products. This shows „ou bien que les étoiles de mer ne pondent pas annuellement et à la même saison . . . . ou bien qu'il y a un grand nombre d'Hybrides dans les deux espèces, dont les organes génitaux n'atteignent jamais la maturité ou seulement rarement“. The question is, however, not treated in a more detailed manner, and no description is given of the supposed hybrids.

Quite recently a supposed hybrid of Asterids has been described by Kalischewskij (Zur Kenntnis der Echinodermenfauna des Sibirischen Eismeeres)[1]). It is named *Asterias groenlandica* (Steenstrup) varietas *longimana* Kalisch., but the description ends thus: „Es ist überhaupt leicht möglich dass dieses Exemplar ein Bastard zwischen *Asterias groenlandica* (Steenstrup) and *Asterias hyperborea* Danielssen et Koren ist“. I do not venture to judge of this case myself; but since both *A. groenlandica* and *hyperborea* are very variable and perhaps even represent only varieties of *A. Mülleri* Sars, the suggestion that the specimen described by Kalischewskij is a hybrid between the two forms seems to me somewhat problematic.

While no cases of natural hybrids have been described — so far as I know — among Ophiurids, Holothurids or Crinoids, some few cases of Echinoid-hybrids have been recorded. It may prove

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[1]) Mém. Acad. Imp. Sc. St. Petersborg. 8 Sér. XVIII. Nr. 4. 1907, p. 41. Tab. I. Fig. 10 a-b. Tab II. Fig. 8 a-b.

useful to give a short summary of what has hitherto been made known about the matter.

In the „Ingolf“ Echinoidea I. (1903, p. 162) mention is made of a pair of specimens from Norway, which „combine to a curious degree the characters of both *E(chinus) esculentus* and *acutus*, var. *Flemingii*, so that it is quite impossible to decide with certainty to which of these species they belong, and the supposition of their being hybrids between the two species seems very obvious“. Unfortunately both are naked tests so that several of the more important specific characters cannot be observed, and thus full certainty cannot be reached. No figures were given in the work quoted, so I have thought it desirable to figure one of the specimens at this occasion (Fig. 1). It will be seen that the shape is quite that of *esculentus*, while the tuberculation is more like that of *acutus* var. *Flemingii*, the tubercles only being somewhat smaller than is generally the case in this form. The colour is a combina-

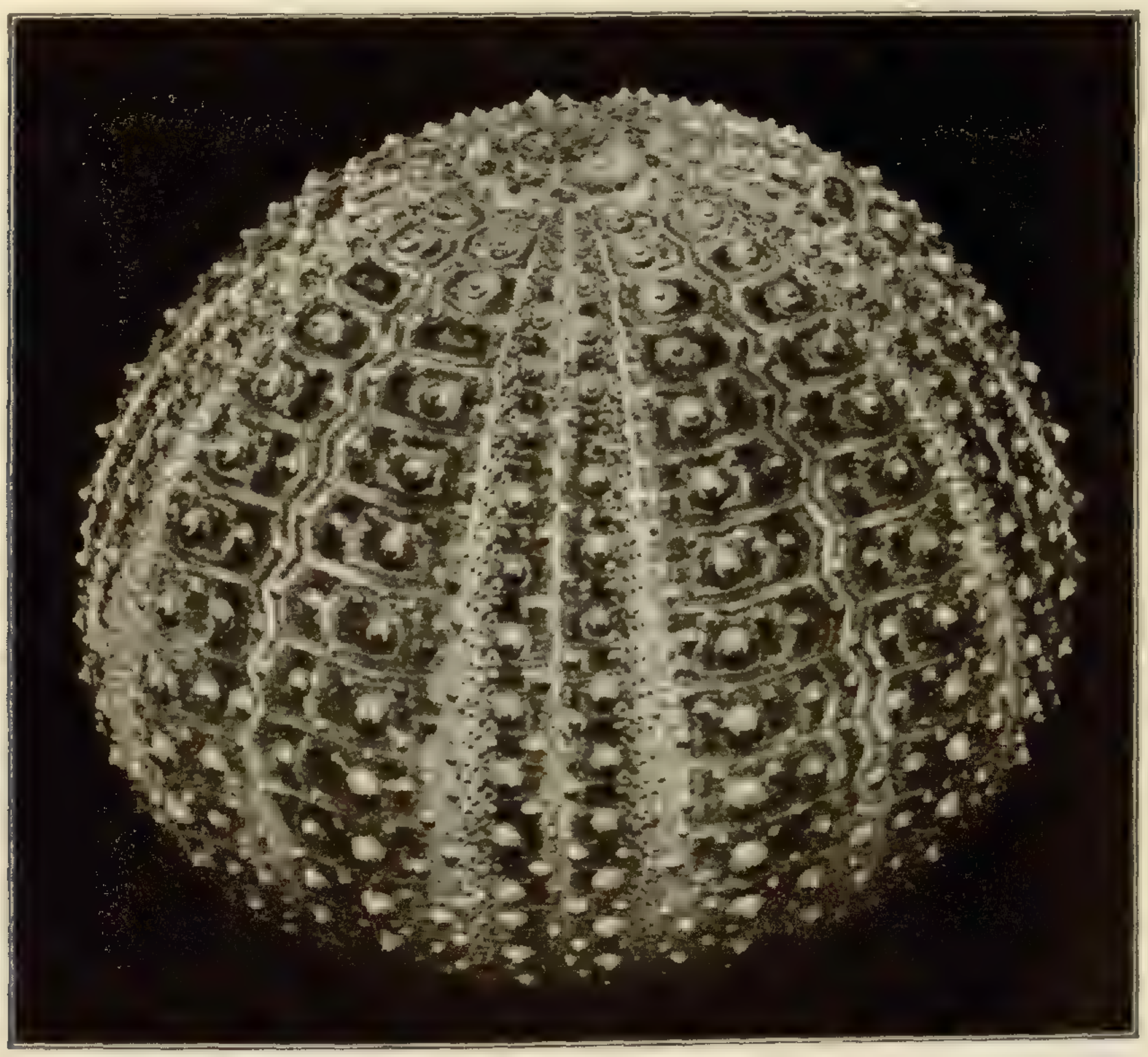

Fig. 1.
Supposed hybrid of *Echinus esculentus* and *Ech. acutus*. Nat. size.

tion of that characteristic of both species: the ground colour is red as in *esculentus*, but the middle line of the ambulacra and inter-ambulacra form stripes of light, nearly white colour, as in *Flemingii*.

In the same work, Part. II (p. 130, Pl. II. Figs. 12, 14, 16), is described and figured a specimen supposed to be a hybrid between *Spatangus purpureus* and *Spat. Raschi*; it „would on account of the high shape of the test decidedly be referred to *S. Raschi*; but the other characters (especially the subanal fasciole and the pedicellariæ) are quite those of *purpureus*. The petals are somewhat shorter than usual, especially the posterior ones". — Specimens intermediate between these two species were mentioned by Bell, who in his Report on the Echinodermata of a deep-sea trawling cruise off the S. W. Coast of Ireland, under the direction of Rev. W. Spotswood Green[1]) mentions „a fine series (of *Spatangus Raschi*) .... showing how very considerably this species varies, so much, indeed, that one is almost inclined to suspect that it forms hybrids with *S. purpureus*".

Considerably more interest is attached to a supposed case of hybridisation between two West Indian Cidarids, *Tretocidaris Bartletti* (A. Ag.) and *Stylocidaris affinis* (Phil.). In the „Hawaiian and other Pacific Echini. The Cidaridæ"[2]) A. Agassiz and H. Lym. Clark make the remarkable statement that in *Tretocidaris Bartletti* two kinds of large globiferous pedicellariæ occur, which were otherwise regarded by me (Ingolf-Echinoidea) as characteristic of two different genera. H. Lym. Clark figures in his memoir „The Cidaridæ"[3]) (Pls. 8—9) a specimen of *Tr. Bartletti* which differs conspicuously from the usual form of this species in having cylindrical and nearly smooth spines, while the typical form has tapering, thorny spines, the spinelets being developed only on the upper (adapical) side of the spines (comp. my paper „On some West Indian

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[1]) Ann. Mag. Nat. Hist. 6 Ser. IV. 1889, p. 442.
[2]) Mem. Mus. Comp. Zool. XXXIV No. 1. 1907, p. 8.
[3]) Bull. Mus. Comp. Zool. LI. No. 7. 1907.

Echinoids“ Pls. 2—3)[1]), and this was the specimen with the two kinds of large globiferous pedicellariæ, as I was informed by Professor Clark. On account of this I suggested (in „Die Echinoiden der Deutschen Südpolar Expedition“. 1909, p. 47) that this specimen represented a hybrid between *Tretocidaris Bartletti* and *Stylocidaris affinis*. Having later on had occasion to examine a specimen with the same form of spines and the two kinds of globiferous pedicellariæ I feel more convinced that this is really a hybrid between the two species named („On some West Indian Echini“ p. 10). — This case is the more interesting, as it represents a hybrid between two distinct genera. The characters of the hybrid are mainly like those of *Tretocidaris Bartletti*; as characters inherited from the other supposed parent species, *Stylocidaris affinis*, must be regarded the cylindrical, nearly smooth spines and the one kind of large globiferous pedicellariæ (without endtooth), this form being (in the specimen examined by me) much rarer than that characteristic of *Tretocidaris* (with a long endtooth and a very small pore).

In the „Echinoidea of the Swedish Southpolar Expedition“[2]), p. 48, I have mentioned a specimen, which I suppose to be a hybrid between *Sterechinus Agassizii* Mrtsn. and *St. Neumayeri* (Meissner). It affords a remarkable confusion of the characters of these two species; but as the species of the genus *Sterechinus* do not, upon the whole, differ very conspicuously from each other, this case of hybridisation is not very conspicuous either.

To the above recorded instances of hybrids of Echinoíds I can now add a new one, and even one of unusual interest, being a hybrid between two different genera and one, of which there can scarcely be any doubt that it really represents a case of hybridisation.

On an excursion to the Sound, North of the Island of Hven, with the steamer of the Danish Biological Station „Sallingsund“, the 10th September this year (1910), I collected a specimen of

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[1]) Bull. U. S. Nat. Museum. 74. 1910.

[2]) Schwedische Südpolar Exped. 1901—1903. Bd. VI. 4. 1910.

an *Echinus* which at once attracted my attention. It seemed to be *Ech. esculentus*, but looked, however, rather different from the usual appearance of this species. On examining the specimen more closely later on I found my first impression confirmed — it was an *Echinus esculentus*, but one differing in some important characters from the usual form. I may give here a description of the specimen (Fig. 2).

The diameter is 53 mm, the height 28 mm. The number of ambulacral plates is 42, that of the interambulacral plates 21 in

Fig. 2.
Hybrid of *Echinus esculentus* and *Parechinus miliaris*. Nat. size.

each series. The shape of the test is unusually low, as in the variety *fuscus*. In the structure of the test is seen a very conspicuous difference from *Ech. esculentus*, viz. that all the ambulacral plates bear a primary tubercle, while in *esculentus* only every second ambulacral plate bears a primary tubercle; only on the oral side some few of the ambulacral plates lack the primary tubercle. The tubercles are somewhat smaller than usually in *esculentus*, especially the secondary tubercles are less prominent. The spines are green, not violet on the tip as is usually the case in *esculentus*. It is especially to be remarked that spines are

found on the buccal plates, a character found alone in *Ech. esculentus* among the Echinoids of the Scandinavian Seas. Also the structure of the spines is as in *esculentus* (comp. „Ingolf"-Echinoidea I. Pl. XX, Fig. 30). The pedicellariæ are as usual in *esculentus*. The colour of the test is pink, not the deep red characteristic of *esculentus*. — The genital pores are well developed, the specimen having thus evidently had the genital organs well developed.

If this specimen had come from a locality, where the existence of some unknown *Echinus*-species could not beforehand be denied, nobody, I suppose, would have hesitated to declare this specimen to represent a new species. The whole appearance is very unlike that of *esculentus*, and especially the character of the ambulacra, being of primary importance among the *Echinus*-species (and upon the whole among the Echinina), would make it almost inevitable to regard it as a new specific type. But the Danish Seas are so well known that the suggestion of a hitherto unknown, large species of *Echinus*, with well marked characters, existing there must seem quite absurd. The result is then that the specimen must be a hybrid, the question being only, which species should be regarded as the parents.

Only three species of regular Echinoids occur in the Sound, viz. *Parechinus miliaris*, *Echinus esculentus* and *Strongylocentrotus drøbachiensis*. It is, however, only the last named, which occurs commonly here, and especially *Ech. esculentus* is very rare. Nevertheless there cannot be the slightest doubt that *Ech. esculentus* is one of the parents, the specimen agreeing in most of it characters with this species. The other parent species very probably is *Parechinus miliaris*. The close tuberculation of the ambulacra is decidedly in favour of this supposition; on the other hand there is not a single feature which points distinctly towards *Str. drøbachiensis*. In case this latter species were one of the parent species, one should expect to find something recalling its more important characters: the polyporous condition of the ambulacra, the peculiar globiferous pedicellariæ (the valves being without

side-teeth), the spicules, and perhaps also the apical system (the ocular plates being partly in contact with the anal area) — but there is no indication of any of these characters.

The conclusion seems then inevitable that this specimen represents a hybrid between *Echinus esculentus* and *Parechinus miliaris*. There is, to be sure, one other explanation possible — that it may represent a case of discontinuous variation or a mutation of *Echinus esculentus*. But this is, as concerns the Echinoderms at least, a quite unknown field as yet. I can give no definite proof, that the present case is not really to be thus explained; but, so far as I can see, evidence goes towards declaring the specimen to be a hybrid. The final solution of the question can scarcely be given before we have obtained fullgrown specimens of artificial hybrids between these two species.

It should still be pointed out that both *Parechinus miliaris* and *Echinus esculentus* occur only in the northern part of the Sound, the influence of the brackish Baltic waters making the salinity too low for their thriving farther down in the Souud. This fact, that the two species in question are thus limited here in their distribution towards the Baltic through the lowering of the salinity of the sea water may well be worth recalling in this connection. May it not be supposed that the low salinity has made the egg less resistant towards the spermatozoon of the other species? — If this is really the case, one should expect hybrids to be comparatively common on such places. This part of the question, at least, can easily be solved by future investigations on the locality.

25.—1.—1911.

Bidrag til Kundskaben om de islandske Hydroider. II.

Af

B. Sæmundsson.

For 9 Aar siden publicerede jeg en lille Afhandling med ovenstaaende Titel i Naturhistorisk Forenings Videnskabelige Meddelelser for 1902, hvori der blev givet en Fortegnelse over de den Gang fra islandske Farvande kendte Hydroidpolyper. Siden den Tid er der blevet tilvejebragt et betydeligt Materiale af Hydroider fra forskellige Steder ved Islands Kyster. I 1902 blev der af Dr. A. Appellöf og Cand. mag. Ad. S. Jensen, ombord paa den norske Fiskeriundersøgelses-Damper „Michael Sars", samlet Hydroider paa 3 Stationer (Nr. 90, 91 og 95) ved Sydostkysten, i 1903 og 1904 af Dr. Johs. Schmidt og Forfatteren, ombord paa det danske Havundersøgelses-Skib „Thor", paa forskellige Steder ved Syd-, Øst- og Vestkysten. I 1905 foretoges Indsamlinger af stud. mag. Frits Johansen, ombord paa det danske Opmaalings-Fartøj „Beskytteren", paa flere Steder ved Øst-, Syd- og Sydvestkysten og i 1908 af stud. mag. P. Kramp, ombord paa „Thor", paa 6 Stationer ved Vest- og Nordkysten [1]). I Sommeren 1906 samlede Forfatteren igen en Del Hydroider ombord paa Trawleren „Coot" i Faksebugten og endelig i 1908 og 1909 et betydeligt Materiale fra Motorbaad i Hunabugten, Isafjords Dyb, Brede- og Faksebugten og disse Bugters Bifjorde.

[1]) Denne Samling modtog jeg i bestemt Tilstand under Udarbejdelsen af nærværende Afhandling.

Hr. Museums-Assistent Ad. S. Jensen overlod mig velvilligst sin Samling til Undersøgelse, ligesom Hr. Inspektor G. M. R. Levinsen ikke blot har stillet Samlingerne fra „Thor“ og „Beskytteren“ til min Disposition, men som før beredvilligst hjulpet mig paa forskellig Vis, naar jeg har søgt hans Bistand. For disse Tjenester beder jeg de to Herrer, særlig den sidstnævnte, at modtage min bedste Tak.

De af Hr. Dr. A. Appellöf indsamlede Hydroider blev bestemte af Cand. Hj. Broch og anførte i et Arbejde over Hydroider, samlede i Nordhavet i Aarene 1900—1902 (Broch [7], Oversigtstabel). Denne Samling, som tilfaldt Bergens Museum, blev ved Hr. Broch's Mellemkomst velvilligst laant mig til Gennemsyn. For denne Imødekommenhed takker jeg nævnte Museum og Hr. Broch paa det bedste.

Det havde egentlig været min Tanke at offentliggøre dette Arbejde 3—4 Aar før, end det nu bliver Tilfældet, men forskellige Omstændigheder har bevirket, at jeg foretrak at lade det vente til nu, bl. a. den, at jeg i 1907 havde faaet bevilliget Penge af det islandske Althing til i de to næste Somre at foretage Fiskeriundersøgelser med Motorbaad i forskellige Fjorde paa Nordvest- og Vestkysten, netop paa Steder, hvor der aldrig før var blevet samlet Hydroider, og hvor jeg derfor ventede at kunne finde noget af Interesse. Desuden har norske Forskere, Frk. Kr. Bonnevie og særlig Hj. Broch i de senere Aar publiceret flere Afhandlinger om nordiske Hydroider, hvori der dels beskrives nye Arter, dels belyses flere interessante Forhold, f. Eks. Variation hos flere Hydroider, hvorfor det blev nødvendigt for mig at gennemgaa mit Materiale paany [1]).

Siden Fremkomsten af min første Afhandling er der intet publiceret særskilt om Islands Hydroider. I Beretninger fra unge,

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[1]) Desværre havde jeg allerede sendt den største Del af Materialet fra Københavns Museum bort, inden jeg indsaa Nødvendigheden af at foretage en Revision, men uheldigvis var et fornyet Laan af dette ikke muligt, inden Fremkomsten af dette Arbejde.

danske Zoologer, der i de senere Aar har foretaget Fiskeriundersøgelser ved Island, fra Opmaalingsfartøjer, anføres der, i Skildringer af det lavere Dyreliv, nogle faa, før kendte Hydroider. Disse vil blive taget med nedenfor under paagældende Arter. — Det eneste Arbejde af større Betydning for Kundskaben om islandske Hydroider i disse Aar er Broch's ovenfor omtalte Afhandling, der udkom i 1903. I denne anføres der 25 Arter fundne ved Island, hovedsagelig paa to Stationer (90 og 91)[1]). Af disse 25 Arter er 10 nye for Islands Fauna. Disse 10 Arter er:

1. *Corymorpha glacialis*, M. Sars.
2. *Halecium minutum*, Broch.
3. *Campanularia Hincksii*, Alder.
4. *Lafoëa pygmæa*, Alder.
5. *Lafoëa pocillum*, Hincks.
6. *Lafoëa symmetrica*, Bonnevie.
7. *Lafoëa gigantea*, Bonnevie.
8. *Thujaria Hjorti*, Broch (*T. laxa*, Allm.).
9. *Thujaria (Sertularia) Fabricii*, (Levinsen).
10. *Selaginopsis fusca*, Johnst.

I mit forrige Arbejde anførtes der 60 Arter, som kendte ved Island. I det følgende vil der blive tilføjet 22 nye Arter. Da nu de 10 ovenfor nævnte, af Broch fundne, Arter føjes til og én af de ældre stryges, beløber Antallet af de ved Island kendte Hydroider sig for Tiden til 91.

Jeg bemærkede i mit omtalte Arbejde, at det den Gang kendte Antal af islandske Hydroider „rimeligvis vilde vokse ved nærmere Eftersøgning", og den islandske Hydroidfauna er da ogsaa siden bleven forøget med 32 Arter. Jeg maa dog antage, at Antallet vil kunne vokse endnu mere, thi uagtet der er blevet samlet paa mange forskellige Steder, ved Øst-, Syd- og Vestkysten, saa har det som Regel været mere pletvis eller tilfældigt og med andre

[1]) Flere af disse Arter, deriblandt et Par af de nye, havde jeg allerede fundet i Jensen's Samling, da jeg fik Broch's Afhandling at se.

Formaal, end netop det at finde Hydroider[1]). Og ved Nordkysten af Landet er der hidtil kun bleven samlet et ganske ringe Materiale. Jeg tror derfor, at der ved fortsatte Indsamlinger vil endnu findes mange for Faunaen nye Arter.

Samtidig med at Arternes Antal er blevet betydelig forøget, har det samme været Tilfældet med Findestederne for de tidligere kendte Arter, hvorved deres Udbredningsforhold er blevet bedre belyste. Dette gælder hovedsagelig de calyptoblaste Arter, især dem, som lever paa dybere Vand, hvorimod der ikke er fremkommet meget nyt til Oplysning om de gymnoblaste Hydroiders Udbredningsforhold, da disse er meget sparsomt repræsenterede i det nyere Materiale.

Naar der nu i det følgende vil blive opført 91 Hydroider tilhørende den islandske Fauna, maa jeg dertil føje den Bemærkning, at jeg ingenlunde anser dette Tal for absolut rigtigt. Grunden dertil er for det første den, at jeg muligvis har gjort mig skyldig i Fejlbestemmelser, især naar det Materiale, jeg har arbejdet med, har været tarveligt (daarligt konserverede eller ufuldstændige Eksemplarer), og jeg har manglet saavel godt Sammenligningsmateriale som den nødvendige Literatur. Dog tror jeg ikke, at Arternes Antal af denne Grund vil forandres meget. For det andet er Grunden den, at Arterne inden for mange af Hydroidernes Slægter som bekendt varierer i en betydelig eller endog meget høj Grad, saa at det ofte vil blive en Skønssag, hvorvidt et Eksemplar skal regnes til den ene eller den anden Art, selv om man har et rigeligt og godt Materiale til sin Raadighed; men naar det modsatte er Tilfældet, bliver Bestemmelsen vanskelig eller umulig.

Denne Variation hos flere Hydroid-Arter har man jo længe været fortrolig med, og jeg behøver, hvad det angaar, kun at henvise til, hvad Broch anfører i 1. Afsnit af sit nyeste Arbejde over Hydroiderne [12]. Flere Forfattere har paavist og omtalt

[1]) Saaledes blev den største Hydroid-Fangst, jeg var med til paa «Thor», gjort (ved Vestmannøerne), da der blev fisket med Yngeltrawl efter Fiskeyngel i Bunden.

Variation hos enkelte Arter, men en omfattende, systematisk Undersøgelse af disse Forhold, baseret paa et meget stort Materiale fra forskellige Egne, er endnu ikke bleven foretaget. Først naar en saadan Undersøgelse foreligger, kan man vente en solid Grundvold for Begrænsningen af de varierende Arter, og det bør derfor hilses med Glæde, at Hr. Broch i en nær Fremtid vil gøre Studier over disse Forhold. Denne Forsker har allerede gjort en god Begyndelse med to af sine sidste Arbejder [10] og [12], navnlig det sidste, det store Arbejde over Hydroider fra arktiske Egne (Die Hydroiden der arctischen Meere). — Nedenfor vil jeg lejlighedsvis faa Anledning til at berøre Variationsforhold hos islandske Hydroider.

I den følgende Fortegnelse over de islandske Hydroider vil jeg, foruden at opføre de nye Arter og deres Findesteder samt nye Findesteder for de tidligere kendte Arter (i Rækkefølge fra Langanes rundt om Landet til højre), tillige opføre de øvrige kendte Arter, om hvilke jeg intet nyt har at meddele; jeg gør dette, for at denne Fortegnelse tillige kan blive en fuldstændig Liste over de for Tiden fra islandske Farvande kendte Hydroider. Den geografiske Udbredning vil kun blive angivet for de nye Arters (Broch's deri indbefattet) Vedkommende, og disse vil som før blive mærkede med en Stjærne (*) foran Navnet.

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1. Underorden: ***Gymnoblastea*** (Athecata).

1. Fam. **Clavidæ.**

1. ***Clava squamata*** (Müller).

Straumfjörður paa Mýrar (Faxaflói), paa *Ascophyllum* i Stranden (B. Sæm.). — Ellers er den ikke fundet uden for det af mig før, [35], S. 49, omtalte Omraade: Vestmannøerne — Akranes, uagtet jeg har søgt efter den paa flere Steder paa Vestkysten og ved Hunabugten. Det samme gælder de 5 følgende Arter.

2. ***Turris neglecta*** Lesson.

Se nærmere Forf. [35], S. 50.

3. ***Coryne vermicularis*** Hincks.

Se nærmere Forf. [35], S. 50.

4. ***Coryne fruticosa*** Hincks.

Se nærmere Forf. [35], S. 50.

5. ***Syncoryne eximia*** Allm.

Se nærmere Forf. [35], S. 50.

6. ***Syncoryne Sarsii*** Lovén.

Se nærmere Forf. [35], S. 50.

Som de tydeligste Skælnemærker imellem de nævnte to Arter af *Syncoryne* har jeg fundet, at hos *S. eximia* er der en tydelig, om end uregelmæssig, Leddeling paa Stammer og Grene; Stammerne bærer tætstillede, stærkt opad rettede Grene, Polyparіet er lyst hornfarvet, Hydrantherne blegrøde; Højden 2—5 cm. Hos *S. Sarsii* er Ringdelingen svag eller manglende; Stammerne bærer faa, udstaaende Grene; Hydrantherne er orangerøde; Højden kun 2 cm. Disse Forhold varierer dog hos begge Arter, saa at Adskillelsen kan blive vanskelig. Det samme gælder vel ogsaa Arterne af *Coryne*-Slægten. Her vil sikkert Revisionen af et omfattende Materiale være nødvendig.

7. ***Diplura fritillaria*** (Haeckel).

Se nærmere Forf. [35], S. 51.

2. Fam. **Tubulariidæ.**

8. ***Tubularia indivisa*** L.

T. indivisa, Broch [7], Oversigtstabel.
- — Hjort [21], II. S. 114.
- — Børup [13], S. 245.

Loðmundarfjörður, 23—28 m. (B. Sæm.). — 9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf og Jensen). — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m. (Appellöf).

— Vestmanneyjar („Thor", St. 175, 1903 og St. 188, 1904), 53 m. og 66—75 m. (B. Sæm.); indtil 17 cm. høje Rør. — Seltjamarnes, Stranden (B. Sæm.). — Faxaflói, 4 Kml. SSO. af Akranes, 40 m. (B. Sæm.). — Breiðafjörður, Ólafsvik, 41 m. og 10 Kvml. SO. af Skor, „Beskytteren", 53 m. (Børup). — Ísafjarðardjúp („Thor", St. 137, 1904), 115—120 m. (Schmidt). — 24 Kml. VNV. af Ritur-Huk („M. Sars", St. 182, 1903), 150—190 m. (Hjort). — Se nærmere Forf. [35], S. 51.

9. ***Tubularia larynx*** Ell.-Sol.

T. larynx, Hjort [21] II, S. 114.

Vestmanneyjar („Thor", St. 188, 1904), 67—75 m., paa Ormerør (B. Sæm.). — Samme Sted („Thor", St. 175, 1903), 53 m. (B. Sæm.). — Faxaflói, Garðsjór („Thor", St. 278, 1904), 40 m. (Schmidt). — Breiðafjörður, 2 Kvml. NV. af Ballarár-Hrappsey, 16—18 m. (B. Sæm.); paa *Laminaria*-Rødder. — Ísafjörður, 35—40 m. (B. Sæm.); paa *Balanus porcatus* og Bryozoer. — 24 Kvml. VNV. af Ritur-Huk („M. Sars", St. 182, 1903), 150—190 m. (Hjort). — Se nærmere Forf. [35], S. 51—52.

10. ***Auliscus pulcher*** B. Sæm.

Se nærmere Forf. [34], S. 52.

11. ***Amalthea islandica*** Allm.

A. islandica, Schmidt [33], S. 20[1]).

105 Kvml. Ø. af Langanes („Thor", St. 50, 1903), 1440 m. (Schmidt); Bundtemperatur ÷ 0,95° C. — Se nærmere Forf. [35], S. 52.

12. ***Corymorpha nutans*** M. Sars.

C. nutans, Børup [13], S. 245—246.

Faxaflói, 8 Kvml. V. af Grótta Fyr, 38 m. (B. Sæm.). — Breiðafjörður, Ólafsvik, 38—47 m. og 10 Kvml. SO af Skor, 53 m. „Beskytteren" (Børup). — Se nærmere Forf. [35], S. 52.

[1]) Bestemt af Hr. Inspektor Levinsen.

13. ***Corymorpha glacialis*** M. Sars.

C. glacialis, Broch [7], Oversigtstabel.

9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf) 30 mm. højt Eksemplar.

Øvrige Udbredning: Færøerne, nordlige Norge, Spitzbergen, Novaja Zemlja.

3. Fam. **Bougainvillidæ.**

14. ***Hydractinia echinata*** v. Ben.

Se nærmere Forf. [35], S. 52.

15. ***Podocoryne carnea*** M. Sars.

Reyðarfjörður („Thor“, St. 50, 1904), 163 m. paa *Natica* (Schmidt). — ? Meðallandssjór („Thor“, St. 178, 1903), 75 m. (B. Sæm.). — Reykjavik i Stranden, paa *Natica* og *Balanus porcatus* (B. Sæm.). — Skötufjörður 20—30 m., paa en Snegleskal (B. Sæm.). — Se nærmere Forf. [35], S. 53.

16. ***Eudendrium rameum*** (Pall.).

c. 8 Kvml. Ø. for Seyðisfjörður, 120 m., paa Line (B. Sæm.). — 13 Kvml. SSO. af Vestmanneyjar („Thor“, St. 172, 1903), 260—390 m. (B. Sæm.); en 11 cm. høj Koloni. — Grindavik paa opskyllede *Laminaria*-Rødder (B. Sæm.). — Se nærmere Forf. [35], S. 53.

*17. ***Eudendrium ramosum*** (L.).

Faxaflói, 10 Kvml. V. af Akranes, 40 m. og 16 Kvml. NV. af Akranes, 56 m. (B. Sæm.); en 12 cm. høj Koloni.

Øvrige Udbr.: Jan Mayen, nordlige Norge, Evropas Vestkyst, Nordamerikas Østkyst, nordlige Stillehavs Kyster.

18. ***Eudendrium capillare*** Alder.

Faxaflói, 2 Kvml. Ø. for Keflavik („Thor“, St. 40, 1908), 34 m. (Kramp). — Hvalfjörður, 85—95 m., paa *Balanus porcatus* (B. Sæm.). — Se nærmere Forf. [35], S. 53.

19. ***Eudendrium rigidum***? Allm.

Grindavik, paa opskyllede *Laminaria*-Rødder (B. Sæm), et stærkt ringet Eksemplar. — Rimeligvis bør et, i mit forrige Arbejde under *E. rameum* opført Eksemplar, taget ud for Rauðasandur af H. Jensen, henregnes til denne Art, hvis Bestemmelse dog i det hele er usikker, paa Grund af Eksemplarernes daarlige Forfatning. — Se nærmere Forf. [35], S. 53.

20. ***Eudendrium insigne*** Hincks.

Se nærmere Forf. [35], S. 53.

21. ***Dicoryne conferta*** (Alder).

Reyðarfjörður („Thor", St. 50, 1904), 163 m., paa *Buccinum undatum* (Schmidt). — Hvalfjörður, 20—0 m. (B. Sæm.); en meget stor, indtil 10 mm. høj, Koloni paa en af *Pag. Bernhardus* beboet *B. undatum*-Skal. — Kolgrafafjörður, Snæfellsnes, 8—0 m., paa en *B. undatum*-Skal (B. Sæm.). — Hvammsfjörður, 45 m., paa en af *P. Bernhardus* beboet *B. undatum*-Skal (B. Sæm.). — Se nærmere Forf. [35], S. 54.

22. ***Perigonimus repens*** Wright.

Se nærmere Forf. [35], S. 54.

Paa et Par Steder i den indre Del af Faksebugten har jeg paa 26 og 70 m. Dybde fundet en Mængde levende *Astarte Banksii* og nogle *A. borealis* bevoksede med Rørene af en *Perigonimus*, som ikke kan bestemmes nærmere. Ligeledes har jeg fundet en frodig Bevoksning af Rørene af en ubestemmelig *Perigonimus*-Art paa Laaget af *Bucc. undatum*, paa 60 m. Dybde udfor Skagaströnd, Hunabugten. Muligvis høre de alle til *P. repens*.

23. ***Bongainvillea muscus*** Allm.

Se nærmere Forf. [35], S. 54.

2. Underorden: ***Calyptoblastea*** (Thecaphora).

4. Fam. **Campanulariidæ.**

24. ***Campanularia volubilis*** (L.).

C. volubilis, Broch [7], Oversigtstabel.
- — Børup [13], S. 246.

Hjeraðsflói („Thor", St. 214, 1904), 28—47 m., paa *Laom. longissima* (B. Sæm.). — Djúpavogur, 15 m., paa *Diph. filicula* (H. Jónsson). — 9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m. (Appellöf). — Vestmanneyjar („Thor", St. 115, 1903), 53 m., paa *Diph. abietina* og *Hydrallmania* (B. Sæm.). — Faxaflói, Garðsjór („Thor", St. 278, 1904), 40 m., paa *Diph. abietina* (Schmidt). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m., paa *Hydrallmania* og 8½ Kvml. NV. af Grótta Fyr („Thor", St. 34, 1908), 50 m., paa *Diph. abietina* (Kramp). — Hvalfjörður („Thor", St. 167, 1904), 46 m., paa *Sert. tenera* (Schmidt). — Samme Sted, 85—95 m., paa *Diph. abietina* (B. Sæm.). — Breiðafjörður 9 Kvml. SO. af Skor, 13—23 m. „Beskytteren" (Børup). — Samme Fjord, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa *Halec. tenellum* (B. Sæm.). — Patreksfjörður („Thor", St. 59, 1908), 50—15 m., paa *Diph. abietina* (Kramp). — Arnarfjörður („Thor", St. 146, 1904), 62 m., paa *Diph. abietina* (Schmidt). — Se nærmere Forf. [35], S. 54.

25. ***Campanularia integra*** Mc. Gilliv.

Vopnafjörður, paa *Delesseria* i Stranden (B. Sæm.). — Vestmanneyjar, i Stranden, paa *Hyas* (B. Sæm.). — Grindavik, paa Roden af opskyllede Laminarier (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), paa en Bryozo (Kramp). — Reykjavik, 4—6 m., paa Laminarier (H. Jónsson). — Samme Sted, i Stranden, paa *Myt. modiolus* og paa en Bøje (B. Sæm.). — Hvalseyjar (Faxaflói), 10—26 m., paa *Delesseria* og *Laminaria*-Rødder (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa *Delesseria* og 2 Kvml. NV. af Ballarár-Hrappsey,

16—18 m., paa *Delesseria* (B. Sæm.). — Arnarfjörður, paa opskyllet *Laminaria* (B. Sæm.). — Ísafjarðardjúp („Thor", St. 137, 1904), 115—120 m., paa *Tub. indivisa* (Schmidt). — Se nærmere Forf. [35], S. 55.

Den af mig før (l. c.) omtalte Variation i Bægerne hos denne Art er ogsaa meget tydeligt fremtrædende hos de ovenfor anførte Eksemplarer. Snart er der Kolonier, hvor alle Bægerne er tragtformede og tyndvæggede (Ísafjarðardjúp), snart Kolonier, hvor der er tragtformede, tyndvæggede og klokkeformede, tykvæggede Bægere imellem hinanden (Faxaflói, Breiðafjörður).

*26. ***Campanularia groenlandica*** Levinsen.

9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m., paa *Tub. indivisa*, *Bonneviella* og *Diph. fallax* (Jensen). Gonotheker tilstede.

Øvrige Udbr.: Vest- og Østgrønland, nordlige Norge, Beeren Eiland, Hvide Hav, Kara Havet, sibiriske Ishav til Alaska.

27. ***Campanularia Hincksii*** Alder.

C. Hincksii, Broch [7], Oversigtstabel.

9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m. (Appellöf). — Vestmanneyjar („Thor", St. 175, 1903), 53 m., paa *Tub. indivisa* og *Laf. dumosa* (B. Sæm.). — Gonotheker tilstede. — Et af Eksemplarerne fra sidstnævnte Lokalitet viser det ejendommelige Forhold, at 3—4 Stolo-Rør, som løber jævnsides hen ad deres Underlag, Røret af *Tub. indivisa*, bøjer alle paa én Gang ud fra dette og lægger sig sammen til en frit opragende, c. 1 cm. lang, Stamme, fra hvilken Bægerstilkene vokser ud til alle Sider, hvorved denne Del af Kolonien faar en vis Lighed med *C. verticillata*.

Øvrige Udbr.: Storbritannien, Færøerne, Norges Vestkyst, Beeren Eiland, Nordamerikas Østkyst.

28. ***Campanularia Johnstonii*** Alder.

Vestmanneyjar („Thor", St. 175, 1903), 53 m., paa *Diph. abietina* (B. Sæm.). — Samme Sted („Thor", St. 188, 1904), 66—

75 m., paa forskellige Hydroider (B. Sæm.). — Faxaflói, Garðsjór („Thor", St. 278, 1904), 40 m., paa *Diph. abietina* (Schmidt). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m., paa *Diph. filicula* (Kramp). — Reykjavik, Stranden (B. Sæm.). — Gonotheker har jeg ikke kunnet finde. — Se nærmere Forf. [35], S. 56.

29. ***Campanularia verticillata*** (L.).

C. verticillata, Broch [7], Oversigtstabel.

9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m. (Appellöf). — 20 Kvml. SO. af Meðalland, 109 m. (Fr. Johansen). — Vestmanneyjar („Thor", St. 175, 1903), 53 m., paa *Tub. indivisa* og *Laf. gracillima* (B. Sæm.). — Samme Sted („Thor", St. 188, 1904), 66—75 m. (B. Sæm.). En Mængde store, indtil 7 cm. høje, Kolonier. — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m. (Kramp), og 8 Kvml. V. af Grótta Fyr („Thor", St. 167, 1904), 38 m. (B. Sæm.). — Hvalfjörður, 85—95 m., paa *Cardium ciliatum* (B. Sæm.). Mange, indtil 6,5 cm. høje, Kolonier. — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa *Pecten islandicus* (B. Sæm.). — Hvammsfjörður, 45 m., paa *Hydrallmania* (B. Sæm.). — Se nærmere Forf. [35], S. 56.

Allerede ved en flygtig Betragtning lægger man Mærke til en betydelig Variation, saavel i Hydrothekernes Form, som i Tændernes Højde, inden for hver enkelt Koloni. Gonotheker er ofte til Stede i et stort Antal.

30. ***Laomedea flexuosa*** (Hincks).

Skerjafjörður (nær ved Reykjavik), paa *Zostera* (H. Jónsson). — Skarðstöd (ved Breiðafjörður), paa *Ascophyllum* i Stranden (B. Sæm.). — Se nærmere Forf. [35], S. 56 [1]).

[1]) Broch gør [12], S. 228, Note, opmærksom paa, at jeg i mit forrige Arbejde (l. c.) sikkert maa have blandet to Arter sammen, fordi jeg 1) omtaler *L. flexuosa* som fundet paa dybere Vand (indtil 60 m. Dybde) og 2) har iagttaget den med Meduser. Hvad det første Punkt angaar, at denne »ausgesprochen litorale« Art ikke skulde leve paa

31. ***Laomedea geniculata*** (L.).

Obelia geniculata, Børup [13], S. 245.

Vestmanneyjar, i Stranden paa *Hyas* (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor“, St. 40, 1908), 34 m., paa en Bryozo og $8^1/_2$ Kvml. NV. af Grótta Fyr („Thor“, St. 34, 1908), 50 m. (Kramp). — 10 Kvml. NV. af Grótta Fyr, 22 m. (B. Sæm.). — Straumfjörður paa Mýrar, paa Tang i Stranden (B. Sæm.). — Hvalseyjar (Faxaflói), 10—26 m., paa *Hyas* (B. Sæm.). — Kolgrafafjörður, 15—0 m., Breiðafjörður, ved Súgandisey, 10—15 m. og ud for Skarðstöð, 6—8 m., paa Laminarier (B. Sæm.). — c. 9 Kvml. SO. af Skor, 13—28 m. (Børup). — Skötufjörður (Ísafjarðar djúp), 18—0 m., paa Laminarier (B. Sæm.). — Kollafjarðarnes (ved Húnaflói), paa opskyllet Tang og paa Drivtømmer (G. G. Bárðarson). — Hrútafjörður, 6—0 m., paa Laminarier (B. Sæm.). — Eyjafjörður, paa *Lernæa branchialis*, i Gællerne paa en ung Torsk, pilket ved Hrisey (Postdamper „Ceres“). Det lod til, at den befandt sig vel paa dette ejendommelige Voksested, thi den voksede meget frodig paa en stor Del af Snyltekrebsens frie Overflade. — Se nærmere Forf. [35], S. 57.

Medens de fleste af de her anførte Eksemplarer viser sig normale i alle Forhold, udmærker Kolonierne fra „Thor“s St. 34 sig ved en særlig svag Udvikling af de fortykkede Partier, saavel paa Hodrothekernes Yderside (abcauline Side), som i Diaphragmets periferiske Del og Stammens Led under Hydrothek-Stilkens Fæste,

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saa store Dybder, som dem, jeg angiver, saa maa jeg dertil bemærke, at Levinsen oplyser [24], S. 379, at den er fundet i danske Farvande og i Østersøen paa Dybder indtil 30 Fv. (56 m.), og da skulde den vel ogsaa kunne leve paa lignende Dybder ved Islands Sydvest-Kyst. Desværre har jeg nu intet af disse Eksemplarer hos mig, saa jeg kan ikke undersøge, om jeg har gjort mig skyldig i en Fejlbestemmelse; Eksemplarer fra 8 Steder i Kystregionen viser sig alle at være rigtig bestemte. Muligvis har jeg dog forvekslet den med den nedenfor omtalte spinkle Form af *L. geniculata*. — Angaaende det andet Punkt maa jeg oplyse, at jeg har set den med Kønsindivider til de angivne Tider, men det skyldes en Lapsus, at jeg har brugt Udtrykket »Meduser« om de i Gonothekerne sig udviklende Gonophorer.

hvorved de faar en betydelig Lighed med *L. flexuosa* (se Fig. 1). Denne Form nærmer sig vistnok til den af Hincks [18], S. 150 omtalte, fine Form. Blandt en Mængde Eksemplarer fra „Thor"s St. 40, findes der nogle, der danner en smuk Overgang fra den omtalte zarte Form til den normale, robuste. Den anden Yderstilling i denne Variationsrække indtager flere Kolonier fra *Laminaria*-Bæltet, hvor alle de omtalte Partier er særlig fortykkede, og hvor Hydrothekerne er tydelig skæve (symmetriske), med meget korte og faaleddede Stilke (se Fig. 1 og mit ældre Arbejde [35], S. 57 og Tab. 1, Fig. 4). —

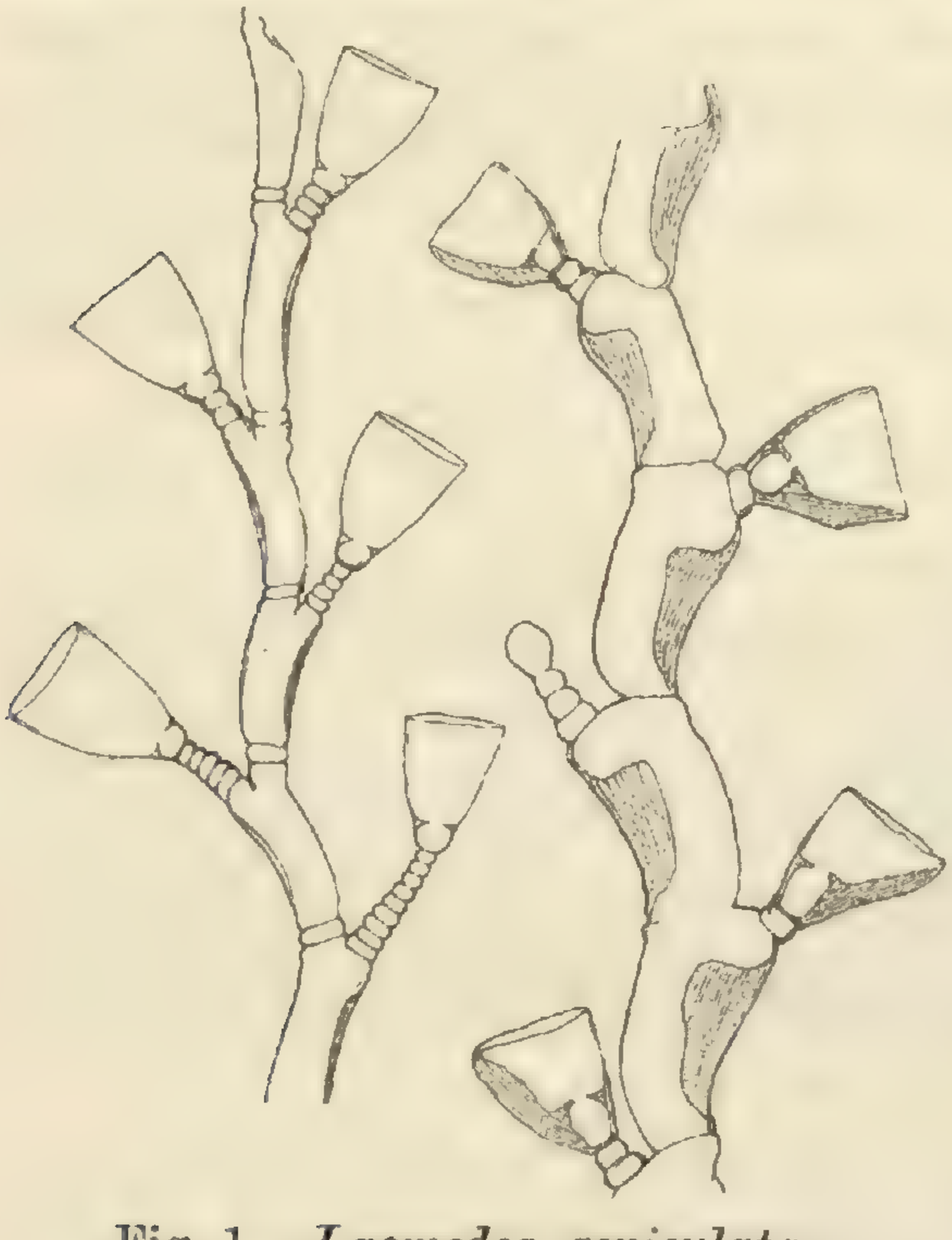

Fig. 1. *Laomedea geniculata*; Stykker af to Kolonier.

32. ***Laomedea gracilis*** M. Sars.

Vestmanneyjar („Thor", St. 188, 1904), 63—75 m., paa *Sert. tenera* (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m., paa en Muslingeskal, og 8½ Kvml. NV. af Grótta Fyr („Thor", St. 34, 1908), 50 m., paa *Hydrallmania* (Kramp). — Hvalfjörður, 85—95 m., paa *Thuj. salicornia* (B. Sæm.). — Hvammsfjörður, 45 m., paa *Hydrallmania* (B. Sæm.). — Se nærmere Forf. [35], S. 48.

*33. ***Laomedea hyalina*** Hincks.

20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m., paa *Bonneviella* (Jensen). — Vestmanneyjar, 28—38 m., paa *Anomia patelliformis* (H. Jónsson). — Samme Sted („Thor", St. 188, 1904),

66—75 m., paa Hydroider (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor“, St. 40, 1908), 34 m., paa *Zostera* og *Diph. filicula*, og 8½ Kvml. NV. af Grótta Fyr („Thor“, St. 34, 1908), 50 m., paa *Hydrallmania* (Kramp). — Hvalfjörður, 85—95 m., paa *Sert. tenera* (B. Sæm.). — Hvalseyjar (Faxaflói), 10—26 m., paa *Hyas* (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa *Hyas* og *Delesseria* (B. Sæm.). — Skjálfandáflói (Bunden) („Thor“, St. 74, 1908), 37—19 m., paa en Bryozo (Kramp). — Langanes („Thor“, St. 78, 1908), 45 m. (Kramp).

Hos Eksemplarerne fra Vestmannøerne varierer Hydrothekernes Form, saavel som Tændernes Størrelse og Form, indenfor hver enkelt Koloni i den Grad, at det kan være vanskeligt at holde den ude fra *L. Lovénii*, hvad ogsaa andre Forskere har erfaret (jvfr. Broch [12], S. 189).

Øvrige Udbr.: Færøerne, Shetland, Skotland, Nordsøen, Skagerrak, Norges Vestkyst, Spitzbergen, Beeren Eiland, nordlige Norge til Berings Strædet, det nordlige Stille Havs Kyster, Grønlands Vestkyst.

34. ***Laomedea gelatinosa*** (Pall.).

Faxaflói, 2 Kvml. Ø. for Keflavik („Thor“, St. 40, 1908), 34 m. (Kramp). Et lille Stykke af en Stamme, med afknækkede Grene og kun nogle faa Hydrotheker.

Som meddelt [35], S. 58, har jeg fundet store Kolonier af dem opskyllede i Borgarfjörður (Faxaflói) og mente derfor, at den maatte være hyppig paa lavere Vand der udenfor. I Sommeren 1909 søgte jeg efter den paa mange Steder, baade inde i nævnte Fjord og uden for den, men fandt den ikke.

35. ***Laomedea longissima*** (Pall.).

Héraðsflói („Thor“, St. 219, 1904), 28—47 m. (B. Sæm.). — Vestmanneyjar („Thor“, St. 175, 1903), 53 m., paa *Tub. indivisa* og Ormerør (B. Sæm.). — Samme Sted („Thor“, St. 188, 1904), 80 m. (B. Sæm.). — Faxaflói, 8 Kvml. VSV. af Grótta Fyr, 28—

34 m., paa *Macoma calcarea* (B. Sæm.). — Reykjavik, paa en Bøje (B. Sæm.). — Hvalseyjar (Faxaflói), 10—26 m., paa Laminarier (B. Sæm.). — Hrútafjörður, 20—30 m., Kjórseyri ved nævnte Fjord, 6—0 m., og Borðeyri ved samme Fjord, 20—0 m., paa Laminarier (B. Sæm.). — Gásir ved Eyjafjörður, paa Laminarier (Ól. Daviðsson). — Højden af de største Eksemplarer er 14—17 cm.

Den af mig før [35], S. 59, omtalte Variation i Hydrothekernes Form og Tandudstyr er ligeledes stærkt udpræget hos enkelte Kolonier i ovenfor omtalte Materiale, især hos Eksemplarerne fra de 3 førstnævnte Stationer.

Se nærmere Forf., l. c.

5. Fam. **Bonnevilleidæ.**

36. ***Bonneviella grandis*** (Allm.).

Lafoëa gigantea, Bonnevie [5], S. 68.

— — , Broch [7], Oversigtstabel.

— — , Hjort [21], II. S. 114.

Bonneviella grandis, Broch [11], S. 198.

Denne kæmpemæssige Hydroid blev først fundet i evropæiske Have (Moldøen ved Norges Vestkyst) under den norske Nordhavs-Ekspedition og beskrevet af Bonnevie (l. c.) under Navnet *Lafoëa gigantea*. Senere har det vist sig, at den er identisk med den af Allman beskrevne Art *L. grandis* fra Japan. Ved indgaaende Undersøgelse af dens Bygning er Broch kommet til det Resultat, at den maa opstilles som hørende til en særskilt Familie.

c. 8 Kvml. Ø. for Seyðisfjörður, 110 m. (B. Sæm.); fisket op paa Line. — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m. (Jensen); indtil 20 cm. høje Kolonier. — 9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf og Jensen). — 24 Kvml. VNV. af Ritur Huk („M. Sars“, St. 183, 1903), 150—190 m. (Hjort).

Øvrige Udbr.: Norges Vestkyst, Japan, Alaska.

6. Fam. **Lafoëidæ.**

37. ***Lafoëa pygmæa*** Alder.

L. pygmæa, Broch [7], Oversigtstabel.

20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m., paa *Sertularia fusca* og *Hydrallmania*, og 9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf). — Selv har jeg ikke set den.

Øvrige Udbr.: Færøerne, Storbritannien, Nordsøen, Skagerrak, Norges Vestkyst, Jan Mayen, Beeren Eiland til Karahavet, Nordamerikas Østkyst.

38. ***Lafoëa pocillum*** Hincks.

L. pocillum, Broch [7], Oversigtstabel.

9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf). — Breiðafjörður, 2 Kvml. NV. af Ballarár-Hrappsey, 16—18 m.; i Mængde paa *Delesseria* (B. Sæm.). — Ud for Vestlandet paa dybt Vand, paa *Diph. abietina* (Kr. Bjarnason).

Øvrige Udbr.: Labrador, Grønlands Vestkyst, Storbritannien, Hvide Hav, Karahavet til Beringsstrædet og Alaska.

39. ***Lafoëa symmetrica*** Bonnevie.

L. symmetrica, Broch [7], Oversigtstabel.

20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m., paa *Ant. antennina* (Appellöf og Jensen). Gonotheker ikke tilstede.

Øvrige Udbr.: Færøerne, Nordlige Norge, Beeren Eiland.

40. ***Lafoëa fruticosa*** M. Sars.

52 Kvml. Ø. for Langanes („Thor“, St. 137, 1904), 540—350 m., paa en Svamp (B. Sæm.); fisket op paa Line. — 20 Kvml. Ø. for Seyðisfjörður, 253 m. (Wandel). — c. 8 Kvml. Ø. for samme Fjord, 110 m. (B. Sæm.); fisket op paa Line. — Reyðarfjörður („Thor“, St. 49, 1904), 95 m. (Schmidt). — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m. (Appellöf og Jensen). — Ísafjarðardjúp („Thor“, St. 217, 1904), 115—120 m., paa *Sert.*

tamarisca og *Tub. indivisa* (Schmidt). — Se nærmere Forf. [35], S. 59.

Hos Eksemplaret fra Reyðarfjörður var de fleste af Hydrothekerne faldne af, dog var der af nogle den nederste Del tilbage, lukket af et indad hvælvet Laag (Vinterdvale?; det er taget den 30. April; Bundtemperatur 1,20°).

41. *Lafoëa gracillima* (Alder).

L. gracillima, Broch [7], Oversigtstabel.

Ca. 8 Kvml. Ø. for Seyðisfjörður, 110 m. (B. Sæm.); fisket op paa Line. — 20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m. (Appellöf). — 9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m., paa *Bonneviella* (Jensen). — 27 Kvml. SV. af Ingólfshöfði, 110 m., „Beskytteren" (Fr. Johansen). — 5 Kvml. SO. af Vestmanneyjar („Thor", St. 163, 1903), 157 m. (B. Sæm.). — 32 Kvml. S. af Selvogstangar („Thor", St. 176, 1904), 170 m. (B. Sæm.). — Se nærmere Forf. [35], S. 60.

Jeg gjorde i mit forrige Arbejde, l. c., den Bemærkning, at jeg ingen Overgangsformer havde set imellem disse to sidstnævnte Arter. Men ved Undersøgelsen af et større Materiale af begge har jeg truffet Former, især af *L. fruticosa*, som udfylder Kløften imellem disse to Arter i den Grad, at det i enkelte Tilfælde har været ret vanskeligt at holde dem ud fra hinanden. Broch har [9 og 10] gjort nærmere Rede for disse to og den følgende Arts Variationsforhold. Ligesom *L. fruticosa* paa den ene Side nærmer sig til *L. gracillima*, lader det til, at den paa den anden Side optræder i Former, der nærmer sig til *L. symmetrica*; men da jeg kun har haft et ringe Materiale af denne Art til Undersøgelse, skal jeg ikke udtale mig nærmere om denne Sag. Gonotheker („Coppinier") af *Lafoëa*-Arterne har jeg kun sjælden fundet.

42. *Lafoëa dumosa* Flem.

L. dumosa, Broch [7], Oversigtstabel.

c. 8 Kvml. Ø. for Seyðisfjörður, 110 m. (B. Sæm.); fisket paa Line. — 9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m.

(Appellöf). — 9 1/2 Kvml. SV. af Ingólfshöfði, 100 m.; „Beskytteren“ (Fr. Johansen). — 13 Kvml. SSO. af Vestmanneyjar („Thor“, St. 171, 1903), 266 m. (B. Sæm.). — Vestmanneyjar („Thor“, St. 188, 1904), 66—75 m., paa *Hydrallmania*, og samme Sted („Thor“, St. 175, 1903), 53 m., paa *Tub. indivisa* og Smaastene (B. Sæm.). — Hvalfjörður, 85—95 m., paa *Diph. abietina* og *Pect. islandicus* (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa Ormerør og *Delesseria* (B. Sæm.). — Se nærmere Forf. [35], S. 60.

Hos flere Kolonier, især dem fra „Thor“ St. 175 og fra sidste Lokalitet, findes der en Antydning til Spiraldrejning af Hydrothek-Stilken (c. 1/2 Omdrejning), særlig hos de Hydrotheker, der udspringer fra Stolo, i Lighed med hvad Broch omtaler [10]. Herved faar Hydrothekerne en vis Lighed med dem hos *L. gracillima*.

43. ***Filellum serpens*** (Hass.).

Lafoëa serpens, Broch [7], Oversigtstabel.

Reyðarfjörður, 110 m. (B. Sæm.). — Fáskrúðsfjörður, paa *Sert. cupressina* (Hørring). — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m., paa *Hydrallmania* (Appellöf og Jensen). — 9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf). — 9 1/2 Kvml. SV. af Ingólfshöfði, 100 m.; „Beskytteren“ (Fr. Johansen); med Gonotheker. — Vestmanneyjar („Thor“, St. 175, 1903), 53 m. og samme Sted („Thor“, St. 188, 1904), 66—75 m. (B. Sæm.). — Faxaflói, Garðsjór („Thor“, St. 278, 1904), 40 m. (Schmidt). — 2 Kvml. Ø. for Keflavik („Thor“, St. 40, 1908), 34 m. (Kramp). — 7—8 Kvml. Ø. af Garðskagi, 40 m. (B. Sæm.). — 8 1/2 Kvml. NV. af Grótta Fyr („Thor“, St. 34, 1908), 50 m., paa *Hydrallmania* (Kramp). — Patreksfjörður („Thor“, St. 59, 1908), 50—15 m. (Kramp). — Ud for Vestlandet, paa dybt Vand (Kr. Bjarnason). — Hvor andet ikke er angivet, er den fundet voksende paa *Diph. abietina*. — Se nærmere Forf. [35], S. 61.

44. ***Grammaria abietina*** (M. Sars).

20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m., paa *Balanus* (Jensen). — 9½ Kvml. SV. af Ingólfshöfði, 100 m., „Beskytteren“ (Fr. Johansen). — Se nærmere Forf. [35], S. 61.

45. ***Grammaria immersa*** Nutting.

C. 8 Kvml. Ø. for Seyðisfjörður, 110 m. (B. Sæm.); mange Kolonier, fisket op paa Line.

Øvrige Udbr.: Grønlands Østkyst, Spitzbergen, Beeren Eiland, Murmankysten, Asiens Nordkyst til Beringsstrædet og Alaska.

46. ***Lictorella Levinseni***, n. sp.

Descriptio: Hydrorhiza e tubis irregulariter curvatis constans rete quoddam plus minusve densum, per substratum extensum format. — Hydrocaulis erectus, compositus, ramosus. Ramuli ipsi compositi, distichi, irregulariter alternantes. Pinnulæ articulatæ simplices distichæ, regulariter alternantes. Hydrothecæ, 2—4 cuique internodio affixæ, sat magnæ, anguste campanulatæ (latitudo maxima dimidium longitudinis fere æquans), diaphragmate conspicuo a pedunculo sejunctæ. Pedunculus lævis, dimidium longitudinis hydrothecæ fere æquans, ad basin constrictione a processu, ab ramulo exeunte, distinctus.

Gonothecæ aut hydrocauli, aut ramulis affixæ, series densas (scapas) formantes. Gonothecæ singulæ ovatæ, in superiore parte tubulis duobus oppositis, incurvatis, apertura circulari ad basin versa, instructæ (in toto anchoriformes).

Nematothecæ calyciformes per coloniam sparsæ, præsertim ad basin pedunculorum hydrothecarum et inter gonothecas, reperiuntur.

Altitudo coloniæ c. 55 mm.

Habitat ad oram meridionalem Islandiæ, prope insulas Vestmanneyjar, profund. 510 m.

Hydrorhiza danner et Overtræk af uregelmæssig bugtede Rør paa Underlaget. Stammen er opret, sammensat, dannet af flere sammenvoksede Rør, hvoraf et ligger centralt, mens de andre

ordner sig mere eller mindre regelmæssig uden om det. Kolonien er fjerformet, gentagne Gange grenet, med afvekslende 2-radede Grene. Grenene af 1. Orden er sammensatte, de andre usammensatte og dannede paa den Maade, at et af de periferiske Rør enten bøjer ud fra Stammen (Grenen), eller forgrener sig.

Hydrothekerne er afvekslende, 2-radede (dog hyppig bøjede opad), smalt klokkeformede, med en tydelig udfaldende Rand og

Fig. 2. *Lictorella Levinseni*. *a*. En fuldvoksen Koloni med Gonotheker, paa *Oculina*. 1/1. *b*. Unge Kolonier paa en *Paramuricea*-Gren. 1/1. *c-d*. Brudstykker af Grene med Hydrotheker. *e*. Tværsnit af Stammen, visende det centrale og de periferiske Rør. *f*. Stykke af en Gren med to Nematotheker. *g*. Et Nematothek. *h-i*. Et Gonothek, set fra Siden og fra Fladen.

cirkelrund Aabning, omtrent dobbelt saa høje som vide, hyppig med Fornyelsesringe ved Randen. De begrænses forneden af et veludviklet Diaphragma, som skiller dem tydelig fra Stilken. Denne er temmelig kort, glat (uden nogen Antydning til Spiraldrejning eller Ringdeling) og smalner lidt af nedefter. Den er ved en Indsnøring tydelig skilt fra et lille Fremspring paa Grenen, hvortil den er fæstet.

Gonothekerne er samlede i tætte Rækker (Scapus) paa flere Steder af den øverste Del af Stammen og (hos det ene af mine Eksemplarer paa én af) Grenene. De er meget karakteristiske af Form, ægformede og forsynede med to modsatte, temmelig vide, nedad krummede Mundingsrør, som vender Aabningen nedad, hvorved de som Helhed bliver nogenlunde ankerformede. Foroven har de en temmelig skarp Kant. De staar tværstillede i Rækkerne.

Nematophorer findes hos denne Art, hvad der ikke skal være Tilfældet med andre Arter af denne Slægt. De forekommer især imellem Gonothekerne (i Scapus) og enkelte eller parvis ved Grunden af Hydrothekstilkene, sjælden i en større Afstand fra disse. De er bægerformede, med udadbøjet Rand og en ganske kort, tilleddet Stilk. De viser én eller flere Fornyelsesringe paa Midten eller nær ved Mundingen, hvorved de faar en vis Lighed med Hydrothekerne hos *Halecium*.

Den er kun fundet paa ét Sted: 9 Kvml. SSO. af Vestmanneyjar („Thor", St. 168, 1903), 510 m., paa Koraller (*Oculina* og *Paramuricea*) i to Eksemplarer, hvoraf det ene er ungt og uden Gonotheker.

Øvrige Udbr. ubekendt.

7. Fam. **Campanulinidæ.**

47. ***Opercularella lacerata*** (Johnst.).

Reyðarfjörður („Thor", St. 49, 1904), 95 m., paa *Halec. labrosum* (Schmidt). — 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m., paa en Bryozo (Kramp). Et ganske lille Eksemplar. — Se nærmere Forf. [35], S. 61.

48. ***Calycella syringa*** (L.).

Djúpavogur, 15 m., paa *Diph. filicula* (H. Jónsson). — 2 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m., paa *Bonneviella* (Jensen). — Vestmanneyjar („Thor", St. 175, 1803), 53 m., paa *Hydrallmania* (B. Sæm.). — Samme Sted („Thor", St. 188, 1904), 66—75 m. (B. Sæm.). — Grindavik, opskyllet, paa *Diph. filicula*

(B. Sæm.). — Faxaflói, sydlige Del, mange Steder, 23—56 m., paa forskellige Hydroider (Kramp, Schmidt, B. Sæm.). — Hvalfjörður („Thor", St. 167, 1904), 46 m., paa *Sert. tenera* (Schmidt). — Samme Fjord, 85—95 m., paa *Camp. verticillata*, *Thujaria laxa* og *Halec. halecinum* (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa flere forskellige Hydroider (B. Sæm.). — Skjálfandi („Thor", St. 74, 1908), 37—19 m., paa en Bryozo (Kramp). — Se nærmere Forf. [35], S. 61.

49. ***Cuspidella humilis*** Hincks.

$8^1/_2$ Kvml. NV. af Grótta Fyr („Thor", St. 34, 1908), 50 m., paa *Diph. filicula* (Kramp).

Øvrige Udbr.: Davisstrædet, Grønlands Østkyst, Storbritannien, Nordsøen, Skagerrak, nordlige Norge, Spitzbergen, Asiens Nordkyst.

50. ***Lafoëina maxima*** Levinsen.

Hrútafjörður, 45 m., paa *Pect. islandicus* og *Card. ciliatum* (B. Sæm.). Meget kraftige, indtil 34 mm. høje Kolonier.

Øvrige Udbr.: Farvandene V. for Grønland, Spitzbergen, Beeren Eiland, nordlige Norge, Hvide Hav, Asiens Nordkyst.

8. Fam. **Sertulariidæ.**

51. ***Sertularia cupressina?*** L.

Reyðarfjörður („Thor", St. 48, 1904), 150 m. (Schmidt). En 50 mm. høj Koloni. — Fáskrúðsfjörður, 38—94 m. (Hørring). — Arnarfjörður („Thor", St. 146, 1904), 62 m. (Schmidt). — Se nærmere Forf. [35], S. 62.

De af mig før (l. c.) til denne Art henførte Eksemplarer hører maaske allesammen til næstfølgende Art, og det samme vil vistnok ogsaa blive Tilfældet med de her anførte Eksemplarer (som for Tiden ikke er mig tilgængelige til fornyet Undersøgelse). De er alle smaa og uden Gonotheker. Jeg vil derfor foreløbig opføre dem med et Spørgsmaalstegn. Se nærmere under næste Art.

52. ***Sertularia tenera*** G. O. Sars.

Bakkafjörður, 47—95 m., „Diana“ (A. C. Johansen). — Lodmundarfjörður („Thor“, St. 186, 1903), 23—28 m. (B. Sæm). — Berufjörður, 11 m. og Lónsvik, 75 m. (A. C. Johansen). — 13 Kvml. SSO. af Vestmanneyjar („Thor“, St. 171, 1903). 266 m. (B. Sæm.). — Vestmanneyjar („Thor“, St. 188, 1904), 66—75 m. (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor“, St. 40, 1908), 34 m. og 8½ Kvml. NV. af Grótta Fyr („Thor“, St. 34, 1908), 50 m. (Kramp). — Hvalfjörður („Thor“, St. 167, 1904), 46 m., paa *Pect. islandicus* (Schmidt). — Samme Fjord, 85—95 m., paa *Pect. islandicus* (B. Sæm.). — Kolgrafafjörður, 26—11 m., paa *Pect. islandicus* (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., Breiðasund, 62 m. og ud for Skarðstöð, 6—8 m. (B. Sæm.). — Hrútafjörður, 20—25 m. (G. Bárðarson). — Disse Eksemplarer naar en Højde af 5—6 cm., og flere af dem, særlig de større, har Gonotheker (se Fig. 3). — Se nærmere Forf. [35], S. 62.

Fig 3. *Sertularia tenera*; Gren med Gonotheker. Fra Hvalfjörður.

Ved Adskillelsen af disse to Arter havde jeg (ligesom Levinsen [24], S. 370) særlig holdt mig til Beskaffenheden af de primære Grene og henført de Eksemplarer, hvor disse igen var forgrenede, til *S. cupressina*; men ved Kendskabet til et større Materiale indsaa jeg, at denne Karakter ikke duer som Skelnemærke imellem de to Arter, idet der hos Eksemplarer, der i andre Forhold, som Hydrothekernes Stilling og Gonothekernes Form, ganske stemmer overens med disse hos *S. tenera*, hyppig findes Grene, som er én Gang (de mindre Eksemplarer) eller gentagne Gange forgrenede (de større). Dette fremhæver Broch ogsaa [12], S. 171, som karakteristisk for de arktiske, sjældnere hos de subarktiske, Former af *S. tenera*. De Eksemplarer af denne Art, som kun har enkelte Grene, er vistnok unge

Individer. Muligvis vil disse to „Arter“ vise sig at være Varianter af en enkelt Art.

53. ***Sertularia argentea*** Ell.-Sol.

Vestmanneyjar („Thor“, St. 188, 1904), 66—75 m. (B. Sæm.). — Mundingen af Ísafjarðardjúp, 40—56 m., „Diana“ (Ditlevsen). — Se nærmere Forf. [35], S. 62.

54. ***Sertularia Fabricii*** Levinsen.

Thujaria fabricii, Broch [7], Oversigtstabel og S. 6.

Ca. 8 Kvml. Ø. for Seyðisfjörður, 110 m., fisket op paa Line (B. Sæm.). En 6 cm. høj Koloni, med mange Gonotheker, hvoraf nogle med to, nogle med kun ét og enkelte uden Horn (se Fig. 4). — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m. (Appellöf). Uden Gonotheker.

Øvrige Udbr.: Grønlands Vestkyst, Alaska.

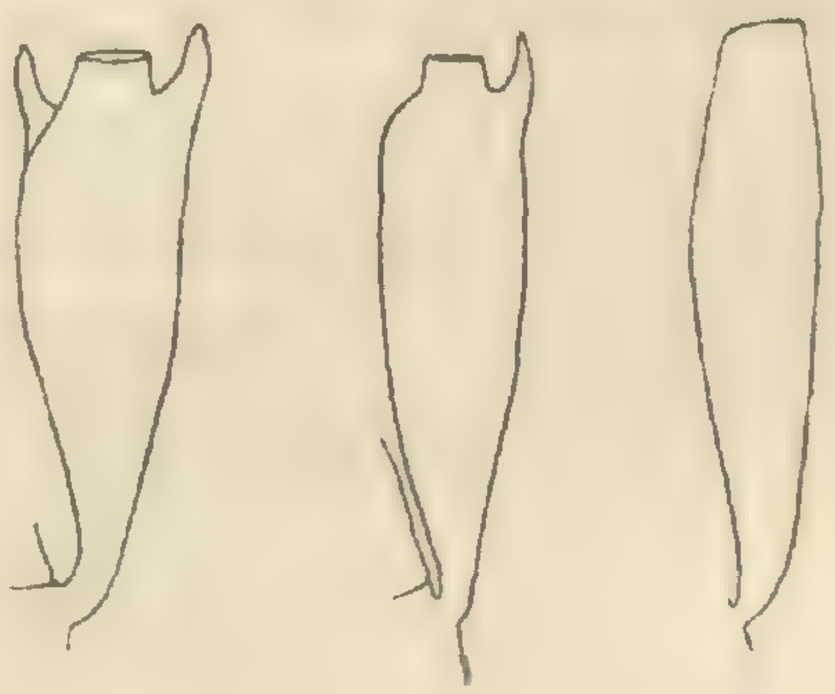

Fig. 4. *Sertularia Fabricii*. Tre Gonotheker af samme Koloni.

55. ***Sertularia pumila*** L.

Hafnarfjörður, Stranden, „Beskytteren“ (Fr. Johansen). — Thormóðssker (Faxaflói), Stranden (B. Sæm.). — Skardstöd, Breiðafjörður, Stranden, paa *Ascophyllum* (B. Sæm.). — Eyjafjörður, paa Tang i Stranden (Ól. Davidsson). — Se nærmere Forf. [35], S. 63.

56. ***Sertularia mirabilis*** (Verr.).

Se nærmere Forf. [35], S. 63.

57. ***Hydrallmania falcata*** (L.).

H. falcata, Schmidt [33], S. 19.

- — , Broch [7], Oversigtstabel.

- — , Børup [13], S. 246.

Lodmundarfjörður („Thor“, St. 186, 1903), 23—28 m. (B. Sæm.). — Reyðarfjörður („Thor“, St. 56, 1903, St. 48, 49, 50

og 56, 1904), 95—163 m. (Schmidt). — Samme Fjord, 150 m. (H. Jónsson). — 46 Kvml. Ø. af Vattarnes („M. Sars“, St. 95), 210 m., 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m. og 9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m. (Appellöf og Jensen). — 3 Kvml. ud for Medalland („Thor“, St. 178, 1903), 75 m. (B. Sæm.); en Mængde Kolonier. — 75 Kvml. S. af Vestmanneyjar („Thor“, St. 164, 1903), 2140 m. (B. Sæm.). — Vestmanneyjar, 110 m., paa en Tufsten (Th. Jónsson). — Samme Sted („Thor“, St. 175, 1903), 53 m., paa *Hal. sessile*, Skalstumper og Balaner (B. Sæm.). — 13 Kvml. VSV. for Garðskagi („Thor“, St. 45, 1908), 98 m., paa *Astarte* (Kramp). Taget i Yngeltrawl, indviklet i Fangtraadene af en *Cyanea*. — Faxaflói, sydlige Del, paa mange Steder, 23—50 m., ofte i stor Mængde (Kramp, Schmidt og B. Sæm.). — Hvalfjörður („Thor“, St. 167, 1904), 46 m. (Schmidt). — Samme Fjord, 85—95 m. (B. Sæm.). — Snæfellsnes, 56 m. „Beskytteren“ (Børup). — Kolgrafafjörður, 26—12 m., paa *Bal. porcatus* (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m. og Breiðasund, 62 m. (B. Sæm.). — Hvammsfjörður, 45 m. (B. Sæm.). — Mundingen af Arnarfjörður („Thor“, St. 146, 1904), 62 m. og Ísafjarðardjúp („Thor“, St. 137, 1904), 115—120 m. (Schmidt). — Se nærmere Forf. [35], S. 63.

Hos unge Eksemplarer er undertiden alle Grenene korte, toradede og enkelte, og hos de ældre er dette gerne Tilfældet med et større Antal af de nederste Grene. Hos et Eksemplar fra Faxaflói har jeg saaledes fundet 18 af den Slags Grene paa hver Side, inden de normale, spiralstillede fjerdelte Grene begynde. Forholdet er altsaa et lignende som det, jeg før har omtalt hos *Thujaria thuja* (op. cit. S. 64). — Den varierer ellers i en meget betydelig Grad, idet den snart er meget sammentrængt og robust, snart meget strakt, med tynde Grene, med temmelig fjærntstillede Hydrotheker.

58. *Thujaria thuja* (L.).

Th. thuja, Broch [7], Oversigtstabel.

Hjeraðsflói („Thor“, St. 189, 1904), 110 m., paa en Basalt-

blok (B. Sæm.). — Seyðisfjörður, 75 m. (H. Jónsson). — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m. (Appellöf). — 9½ Kvml. SV. af Ingólfshöfði, 100 m., „Beskytteren“ (Fr. Johansen). — Grindavik, opskyllet (B. Sæm.). — 2 Kvml. N. af Eldey („Thor“, St. 171, 1904), 150 m. (B. Sæm.). — Faxaflói, 6—10 Kvml. VSV. af Grótta Fyr (B. Sæm.). — Hvalfjörður, 85—95 m., paa *Pect. islandicus*, *Cardium groenlandicum* og *C. ciliatum* (B. Sæm.). — 63 Kvml. VNV. af Látrabjarg („Thor“, St. 150, 1904), 392 m.; Mundingen af Arnarfjörður („Thor“, St. 146, 1904), 62 m. og Isafjardardjúp („Thor“, St. 137, 1904), 115—120 m. (Schmidt). De største Kolonier er 10—11,5 cm. høje. — Se nærmere Forf. [35], S. 64.

59. ***Thujaria lonchitis*** Ell.-Sol.

Th. lonchitis, B. Sæmundsson [35], S. 65, partim.

?Reyðarfjörður, 150 m., paa en Sten (H. Jónsson). — 27 Kvml. SV. af Ingólfshöfði, 110 m., „Beskytteren“ (Fr. Johansen); en ung Koloni. — ?Faxaflói, Garðsjór („Thor“, St. 278, 1904), 40 m. (Schmidt). — 4 Kvml. NO. af Garðskagi, 47 m. (B. Sæm.). — Ísafjarðardjúp („Thor“, St. 137, 1904), 115—120 m. (Schmidt). — 6 Kvml. SSV. af Grótta Fyr, 38 m. (B. Sæm.). — Hvalfjörður, 85—95 m., mange smaa Kolonier uden Gonotheker, paa *Pect. islandicus*, *Card. groenlandicum* og *Bal. porcatus* (B. Sæm.). — Se nærmere Forf., l. c.

Da der iblandt de Eksemplarer, jeg før havde henført til denne Art, findes nogle, som har vist sig at tilhøre andre Arter af denne Slægt, sætter jeg her et Spørgsmaalstegn ved Findestederne af et Par Eksemplarer, jeg ikke har kunnet underkaste et nyt Eftersyn.

60. ***Thujaria laxa*** Allm.

Th. hjorti, Broch [7], Oversigtstabel og S. 7.

Hjeraðsflói („Thor“, St. 189, 1903), 110 m., paa en Basaltblok (B. Sæm.)., en 6 cm. høj Koloni. — 20 Kvml. OSO. af Papey

(„M. Sars“, St. 91), 150 m. (Appellöf). — Hvalfjörður, 85—95 m.; 3—5 cm. høje Kolonier, uden Gonotheker.

Øvrige Udbr.: Grønlands Vestkyst, Havet omkring Færøerne, det norske Hav, Spitzbergen, Barents Sø, Murman Kyst, Hvide Hav, Novaja Zemlja.

61. ***Thujaria carica*** Levinsen.

32 Kvml. S. af Selvogstangar („Thor“, St. 176, 1904), 170 m. (B. Sæm.); den øverste Del af nogle Kolonier, uden Gonotheker.

Øvrige Udbr.: Spitzbergen, Beeren Eiland, Hvide Hav, Asiens Nordkyst.

Sammenlignet med et Eksemplar fra Kara Havet er disse meget strakte, med tynde og bøjelige Grene.

62. ****Thujaria arctica*** (Bonnevie).

Th. lonchitis, B. Sæmundsson [35], S. 65, partim.

Vattarnes, Reyðarfjörður, c. 150 m., fisket paa Line (B. Sæm). Mange, indtil 20 cm. høje, Kolonier uden Gonotheker.

Øvrige Udbr.: Mellem Spitzbergen og Beeren Eiland, Beeren Eiland, Murmankysten.

63. ***Diphasia fusca*** Johnst.

Selaginopsis fusca, Broch [7], Oversigtstabel.

Reyðarfjörður og Fáskrúðsfjörður, fisket op paa Line (B. Sæm.); indtil 15 cm. høje Kolonier. — 20 Kvml. OSO. af Papey („M. Sars“, St. 91), 150 m., og 9 Kvml. SV. af Eystrahorn („M. Sars“, St. 90), 75 m., mange Kolonier, paa *Myt. modiolus* (Appellöf og Jensen). — 9½ Kvml. SV. af Ingólfshøfði, 100 m., „Beskytteren“ (Fr. Johansen). — Vestmanneyjar, 94 m. (Th. Jónsson). — Samme Sted („Thor“, St. 188, 1904), 66—75 m. (B. Sæm.).

Øvrige Udbr.: Færøerne, Storbritannien, Norge.

64. ***Diphasia abietina*** (L.).

Thujaria abietina, Broch [7], Oversigtstabel.

Abietinaria abietina, Schmidt [33], S. 19.

Diphasia abietina, Børup [13], S. 246.

Loðmundarfjörður („Thor", St. 186, 1903), 23—28 m. (B. Sæm.). — Ca. 8 Kvml. Ø. for Seyðisfjörður, 110 m., fisket paa Line (B. Sæm.). — Reyðarfjörður („Thor", St. 56, 1903 og St. 48—49, 1904), 62—160 m. (Schmidt). — 20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m. og 9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m. (Appellöf og Jensen). — 9½ Kvml. SV. af Ingólfshöfði, 100 m., „Beskytteren" (Fr. Johansen). — 3 Kvml. ud for Meðalland („Thor", St. 178, 1903), 53 m., og Vestmanneyjar („Thor", St. 175, 1903); paa Smaasten (B. Sæm.). — Grindavik, opskyllet, paa Laminarierødder (B. Sæm.). — Faxaflói, sydlige Del, mange Steder, 23—50 m. (Kramp, Schmidt, B. Sæm.). — Hvalfjörður, 85—95 m. (B. Sæm.). — Snæfellsnes, 58 m., „Beskytteren" (Børup). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m. (B. Sæm.). — Patreksfjörður („Thor", St. 59, 1908), 50—15 m. (Kramp). — Mundingen af Arnarfjörður („Thor", St. 146, 1904), 62 m. (Schmidt). — Se nærmere Forf. [35], S. 65.

65. ***Diphasia filicula*** Ell.-Sol.

Nordøst-Kysten, paa Kalkalger (H. Jónsson). — Loðmundarfjörður („Thor", St. 186, 1903), 23—28 m. (B. Sæm.). — Skálanes, Seyðisfjörður, 13—15 m. og Djúpavogur, 15 m., paa *Bal. porcatus* (H. Jónsson). — 9½ Kvml. SV. af Ingólfshöfði, 100 m. og Vestmanneyjar, „Beskytteren" (Fr. Johansen). — Grindavik, opskyllet (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m. og 8½ Kvml. NV. af Grótta Fyr („Thor", St. 34, 1908), 50 m. (Kramp). — 6—10 Kvml. VSV. af Grótta Fyr, 25—40 m., og Akranes, opskyllet (B. Sæm.). — Hellnar, Snæfellsnes, opskyllet (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m. og Breiðasund, 62 m. (B. Sæm.). — Patreksfjörður („Thor", St. 59, 1908), 50—15 m. (Kramp). — Mundingen af Arnarfjörður („Thor", St. 146, 1904), 62 m. (Schmidt). — Kollafjörður, Húnaflói, 8—10 m. (B. Sæm.). — Se nærmere Forf. [35], S. 66.

I sit nyeste Arbejde [12], slaar Broch denne Art sammen med foregaaende til én Art. Da jeg ikke har lagt Mærke til Overgangsformer imellem dem og ikke har Tid til at foretage et nyt Gennemsyn af mit righoldige Materiale af disse to Arter, vil jeg her holde dem adskilte.

66. ***Diphasia rosacea*** (L.).

Vestmanneyjar („Thor", St. 188, 1904), 80 m. (B. Sæm.). — Hvalseyjar, Faxaflói, 10—26 m., paa *Hyas araneus* (B. Sæm.). — Mundingen af Arnarfjörður („Thor", St. 146, 1904), 62 m. (Schmidt). — Ud for Vestlandet, paa dybt Vand, paa *Hydrallmania* (Kr. Bjarnason). — Se nærmere Forf. [35], S. 66.

67. ***Diphasia fallax*** Johnst.

Dynanema fallax, Broch [7], Oversigtstabel.

Hjeraðsflói („Thor", St. 189, 1903), 110 m. og Loðmundarfjörður („Thor", St. 186, 1903), 23—28 m., paa *Tub. indivisa* (B. Sæm.). — 20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m., paa *Diph. Wandelii* og 9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m., paa *Bonneviella* (Appellöf og Jensen). — 9½ Kvml. SV. af Ingólfshöfði, 100 m., „Beskytteren" (Fr. Johansen). — Vestmanneyjar, 95 m., paa *Antennularia ramosa* (Th. Jónsson). — Samme Sted („Thor", St. 188, 1904), 66—75 m., paa forskellige Hydroider (B. Sæm.). — Faxaflói, Garðsjór („Thor", St. 278, 1904), 40 m. (Schmidt). — 4 Kvml. NO. af Garðskagi, 47 m. (B. Sæm.), 15 cm. høje Kolonier. — 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m. (Kramp). — Breiðafjörður, Stykkishólmur, 56 m. (H. Jónsson). — 1 Kvml. SO. af Vaðstakksey, 37—64 m. (B. Sæm.), mange Kolonier med hanlige Gonotheker. — Patreksfjörður („Thor", St. 59, 1908), 15—50 m., paa *Diph. abietina* (Kramp). — Ísafjarðardjúp („Thor", St. 137, 1904), 115—120 m. (Schmidt). — Se nærmere Forf. [35], S. 66.

68. ***Diphasia Wandeli*** Levinsen.

Thujaria wandeli, Broch [7], Oversigtstabel og S. 7.

Jeg omtalte i mit forrige Arbejde [35], S. 67, et Eksemplar af en *Diphasia*, uden Gonotheker, som jeg henførte til denne Art, da det i et og alt stemte fuldstændig overens med Levinsen's Beskrivelse af denne, undtagen at Hydrothekerne kun sad i 2

Fig. 5. *Diphasia Wandeli*. *a*. En Koloni fra «M. Sars», St. 91. Nat. Størr. *b*. Et Stykke af Stammen, visende de mørke Tværfurer og de brune Pletter ved Grenenes Grund. *c*. Nederste Del af en Gren, visende Grundens fortykkede Vægge. *d*. Hunlige Gonotheker. *e*. Et hunligt Gonothek, set fra oven.

Rækker, i Stedet for i 3 hos den typiske Form. Siden har jeg faaet den fra 2 Steder til: 20 Kvml. OSO. af Papey („M. Sars", St. 91). 150 m. (Appellöf og Jensen) og 9½ Kvml. SV. af Ingólfshöfði, „Beskytteren" (Fr. Johansen).

De af Jensen og Johansen samlede Eksemplarer (begge med hunlige Gonotheker) stemmer ganske overens med det ovenfor

omtalte, medens det af Appellöf tagne Eksemplar (som ikke er komplet og uden Gonotheker, og af Broch bestemt som *Th. wandeli*) viser det interessante Forhold, at af dets 17 Par Grene har 2 paa den ene Side og 6 paa den anden tildels 3 Rækker Hydrotheker (Fig. 6). Hanlige Gonotheker mangler hos alle Eksemplarerne, men de hunlige ligner i høj Grad disse hos *D. fallax*[1]).

Disse Eksemplarer ligner ganske vist i flere Henseender *D. fallax*, men viser dog mange Afvigelser fra den, hvori de netop stemmer overens med *D. Wandeli.* Hvad Polypariet angaar, saa er dette, sammenlignet med *D. fallax* meget mere robust og stift. Stammen er ved mørke Tværfurer delt i korte Led, der hvert bærer en Gren, som ikke deler sig igen og har ved Grunden en brun Plet; hverken Tværfurerne eller Pletterne har jeg kunnet finde hos *D. fallax*, hvor ogsaa Grenene ofte er delte. Grenene er afvekslende og ligger i ét Plan. Hydrothekerne er strængt modsatte (ofte subalternerende hos *D. fallax*).

Fig. 6. *Diphasia Wandeli.* Brudstykke af Stammen af en Koloni fra «M. Sars», St. 91, med en Gren, der begynder med Hydrotheker i to Rækker, men længere ude har dem i 3 Rækker.

Da hanlige Gonotheker ikke findes hos disse Eksemplarer, kan en Sammenligning ikke anstilles. De hunlige Gonotheker ligner, som allerede berørt, i høj Grad dem hos *D. fallax*; dog synes jeg, at Hjørnerne hos mine Eksemplarer er mere bladformede

[1]) Hr. Inspektor Levinsen har gjort mig den Tjeneste at undersøge alle disse Eksemplarer, men han er af den Mening, at de nærmest maa betragtes som hørende til *D. fallax.*

(i tangential Retning) og i det hele taget større end hos *D. fallax*. Hos *D. Wandeli* er de beskrevne Gonotheker vel kun hanlige.

Den habituelle Forskel imellem mine Eksemplarer og *D. fallax* fremtræder meget skarpt, naar (som jeg har set ét Eksempel paa) *D. fallax* vokser paa den anden. Og i Forbindelse dermed vil jeg fremhæve, at den omtalte Form lader til at vokse paa døde Genstande, medens *D. fallax* hyppigst vokser paa andre Hydroider eller Bryozoer. — Overgange imellem de to Former har jeg ikke kunnet finde. Det bør ogsaa fremhæves, at den omtalte Form kun er fundet i det kolde Vand (ved Island), eller nær ved Grænsen imellem dette og det varme Vand.

Af disse Grunde og særlig den, at denne Form kan optræde med Grene, der bærer 3 Rækker Hydrotheker, vil jeg foreløbig henføre den til *D. Wandeli*[1]). Kendskabet til et større Materiale vil vise, hvor til den rettest bør henføres.

69. ***Sertularella rugosa*** (L.).

Reykjavik, i Stranden, paa *Balanus* (B. Sæm.). — Faxaflói, 6 og 10 Kvml. VSV. af Grótta Fyr, 23 og 38 m., og Hvalseyjar, 10—26 m. (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa *Delesseria* (B. Sæm.). — Se nærmere Forf. [35], S. 67.

70. ***Sertularella polyzonias*** (L.).

S. polyzonias, Broch [7], Oversigtstabel.

Loðmundarfjörður („Thor", St. 186, 1903), 23—28 m., paa *Tub. indivisa* (B. Sæm.). — 20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m. (Appellöf). — Vestmanneyjar („Thor", St. 188, 1904), 66—75 m. (B. Sæm.). — 13 Kvml. VSV. af Garðskagi („Thor", St. 45, 1908), 98 m., paa en Svamp (Kramp). — Se nærmere Forf. [35], S. 67.

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[1]) Hos *Thujaria arctica* (Bonnevie) forekommer ogsaa en Foranderlighed i Hydrothekrækkernes Antal; jvfr. Broch [12], S. 177.

71. ***Sertularella tricuspidata*** Alder.

S. tricuspidata, Broch [7], Oversigtstabel.

- — , Børup [13], S. 244 og 245.

Loðmundarfjörður („Thor", St. 186, 1903), 23—28 m. (B. Sæm.). — 20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m. (Appellöf og Jensen). — 9½ og 27 Kvml. SV. af Ingólfshöfði, 100 m. og 110 m., „Beskytteren" (Fr. Johansen). — Vestmanneyjar („Thor", St. 188, 1904), 75 m. (B. Sæm.). — Grindavik, opskyllet paa *Laminaria*-Rødder (B. Sæm.). — Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m. (Kramp). — 6 og 10 Kvml. VSV. af Grótta Fyr, 23 og 28 m. (B. Sæm.). — Grundarfjörður, Snæfellsnes og Breiðafjörður, 9 Kvlm. SO. af Skor, 13—23 m., „Beskytteren" (Børup). — Patreksfjörður („Thor", St. 59, 1908), 50—15 m. (Kramp). — Mundingen at Arnarfjörður („Thor". St. 146, 1904), 62 m. (Schmidt). — Se nærmere Forf. [35], S. 68.

*72. ***Sertularella Gayi*** (Lmrx.).

9½ Kvml. SV. af Ingólfshøfði, 100 m., „Beskytteren" (Fr. Johansen); 30 cm. høj øverste Del af en Koloni. — 13 Kvml. SSO. af Vestmanneyjar („Thor", St. 171, 1903), 266 m. (B. Sæm.). 2 Kolonier, den højeste 9 cm.

Øvrige Udbr.: Nordamerikas Østkyst, Grønland, Færøerne, Shetland, Storbritannien, Nordsøen, Sverigs Vestkyst, Norges Kyster, Berings Havet, Sydafrika, Middelhavet.

73. ***Sertularella tamarisca*** (L.).

Dynamena tamarisca, Broch [7]. Oversigtstabel.

9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m. (Appellöf). — 27 Kvml. SV. af Ingólfshöfði, 110 m., „Beskytteren" (Fr. Johansen). — Vestmanneyjar („Thor", St. 188, 1904), 78 m. (B. Sæm.). — Isafjardardjúp („Thor", St. 137, 1904), 115—120 m. (Schmidt); en 11 cm. høj Koloni med Gonotheker. — Se nærmere Forf. [35], S. 68.

9. Fam. **Haleciidæ.**

*74. ***Halecium halecinum*** (L.).

Vestmanneyjar („Thor", St. 188, 1904), 78 m. (B. Sæm.); nogle indtil 15 cm. høje Kolonier, uden Gonotheker. — Faxaflói, 6 og 10 Kvml. VSV. af Grótta Fyr, 23 m. og 38 m. (B. Sæm.); mange Kolonier, med Gonotheker. — Hvalfjörður, 55 m. og 85—95 m., paa *Pect. islandicus*, *Card. groenlandicum* og *Myt. modiolus* (B. Sæm.); mange, indtil 10 cm. høje, Kolonier, enkelte med Gonotheker.

Øvrige Udbr.: England til Adriaterhavet, Danmark, Norge til det Hvide Hav, Beeren Eiland, Beringshavet og Alaska, Stille Hav.

75. ***Halecium muricatum*** Ell.-Sol.

Reyðarfjörður, 150 m., en 12 cm. høj Koloni, og Djúpavogur, 15 m., paa *Bal. porcatus* (H. Jónsson). — Indløbet til Hornafjörður (Hørring). — Faxafloi, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908), 34 m. (Kramp). — 16 Kvml. NV. af Akranes, 50 m. og Hvalseyjar, 10—26 m. (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m. (B. Sæm.). — Mundingen af Arnarfjörður („Thor", St. 146, 1904), 62 m. (Schmidt). — Se nærmere Forf. [35], S. 69.

76. ***Halecium Beanii*** (Johnst.).

H. Beanii, Børup [13], S. 245 og 246.

Vestmanneyjar („Thor", St. 188, 1904), 66—78 m. (B. Sæm.); en Mængde Kolonier med Gonotheker, tildels paa *Hal. sessile*. — Snæfellsnes, 56 m., „Beskytteren" (Børup). — Kolgrafafjörður, 12—26 m., paa *Bal. porcatus* (B. Sæm.); Gonotheker tilstede i Mængde. — Se nærmere Forf. [7], S. 69.

77. ***Halecium labrosum*** Alder.

Reyðarfjörður („Thor", St. 49, 1904), 95 m. (Schmidt). En tæt og stærkbygget Koloni, med en Mængde Gonotheker. Alle de

yngre Grene (eller Grenenes yngre Dele) synes faldne af og Hydrotheker ikke udviklede (Vinterdvale? Taget d. 30. April. Bundtemperatur + 1,20°). — Vestmanneyjar („Thor", St. 175, 1903 og St. 188, 1904), 53 og 66—75 m. (B. Sæm.). Nogle, indtil c. 9 cm. høje Kolonier, uden Gonotheker. — Se nærmere Forf. [7]. S. 69.

Hal. crenulatum Hincks er, ifølge Broch [12]. S. 150 kun at betragte som en Varietet af sidstnævnte Art. Jeg anførte den før (op. cit. S. 70) som fundet ved Island.

*78. ***Halecium tenellum*** Hincks.

Faxaflói, 2 Kvml. Ø. for Keflavik („Thor", St. 40, 1908). 34 m. (Kramp). — Hvalfjörður („Thor", St. 167, 1904), 46 m., paa *Sert. tenera* (Schmidt). — Samme Fjord, 85—95 m., paa *Thuj. thuja* (B. Sæm.). — Faxaflói, Hvalseyjar, 10—26 m., paa *Hyas araneus* (B. Sæm.). — Breiðafjörður, 1 Kvml. SO. af Vaðstakksey, 37—64 m., paa *Delesseria*, *Hyas* og *Hydrallmania* (B. Sæm.). En Mængde Kolonier, deriblandt nogle med hunlige Gonotheker. Alle de andre her anførte Eksemplarer er uden Gonotheker, men Ligheden imellem dem er saa stor, at jeg maa anse dem alle for at være denne Art. Ringdelingen er overalt meget stærkt udpræget. Deres største Højde er 25 mm.

Øvrige Udbr.: Nordamerikas Kyster, Grønlands Vestkyst, Azorerne, Storbritannien, Helgoland, Jan Mayen, Hvide Hav, Karahavet?, Ildlandet, Australien?.

*79. ***Halecium sessile*** Norman.

27 Kvml. SV. af Ingólfshöfði, 110 m., „Beskytteren", (Fr. Johansen). — Vestmanneyjar („Thor", St. 175, 1903 og St. 188, 1904), 53 og 66—75 m. (B. Sæm); nogle 14—20 cm. høje Kolonier. Gonotheker har jeg ikke fundet.

Øvrige Udbr.: Nordamerikas Østkyst, Storbritannien, nordlige Norge.

*80. ***Halecium curvicaule*** v. Lorenz.

1/2 Kvml. Ø. for Langanes („Thor", St. 78, 1908), 45 m., Ygeltrawl, 35 m. Wire (Kramp). Et lille Brudstykke af en Koloni, uden Gonotheker.

Øvrige Udbr.: Jan Mayen, Beeren Eiland, Murmankysten.

81. ***Halecium minutum*** Broch.

H. minutum, Broch [7], Oversigtstabel og S. 4.

20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m., og 9 Kvml. SV. af Eystrahorn („M. Sars", St. 90), 75 m., paa *Bonnevielle*, *Tub. indivisa* og *Hydrallmania* (Appellöf og Jensen). — Ísafjarðardjúp („Thor", St. 137, 1904), 115—120 m., paa *Thuj. lonchitis* (Schmidt). Alle disse Eksemplarer med Gonotheker.

Øvrige Udbr.: Færøerne, Spitzbergen.

10. Fam. **Plumulariidæ.**

82. ***Antennularia antennina*** (L.).

A. antennina, Broch [7], Oversigtstabel.

20 Kvml. OSO. af Papey („M. Sars", St. 91), 150 m. (Appellöf og Jeusen); en Mængde indtil 35 cm. høje Kolonier. — Se nærmere Forf. [35], S. 70.

*83. ***Antennularia ramosa*** Lmk.

Vestmanneyjar, 95 m. (Th. Jónsson); en 16 cm. høj Koloni. — Samme Sted („Thor", St. 188, 1904), 66—75 m. (B. Sæm.).

Øvrige Udbr.: Skotland, Shetland, Skagerrak.

*84. ***Plumularia pinnata*** (L.).

27 Kvml. SV. af Ingólfshöfði, 110 m.. „Beskytteren" (Fr. Johansen). En 5 cm. høj Koloni, med 3—4 Grene paa hvert Internodium, foroven som oftest 3.

Øvrige Udbr.: Storbritannien, Nordsøen, Skagerrak, Norges Vestkyst, Indiske Hav.

*85. ***Plumularia gracillima*** G. O. Sars.

9½ Kvml. SV. af Ingólfshöfði, 100 m., „Beskytteren“ (Fr. Johansen); indtil 5,5 cm. høje Kolonier.

Den ligner i mange Henseender *P. groenlandica* (Levinsen [22], S. 206). Dens Forgreningsforhold er de samme, ligeledes mangler Grenenes korte hydrothekløse Led hyppig, eller disse er, som Levinsen formoder, voksede sammen med næste hydrothekbærende Led, hvis Antal af Nematophorer nedenfor Hydrotheket da er vekslende, snart kun ét (intet), snart (ved Leddenes Sammensmæltning?) tre (fire); men nogen Regelmæssighed i disse Forhold har jeg ikke kunnet finde. Rimeligvis er disse to Arter meget nærbeslægtede.

Øvrige Udbr.: Norges Vestkyst, Nordamerikas Østkyst.

*86. ***Plumularia setacea*** (Ellis).

Vestmanneyjar, 95 m., paa *Ant. ramosa* (Th. Jónsson); mange, indtil 3 cm. høje Kolonier med Gonotheker.

Øvrige Udbr.: Norges Vestkyst, Helgoland, Storbritannien, Middelhavet, Ceylon, Sydaustralien, Ny Zeeland, Japan, Nord- og Sydamerikas Vestkyst, Florida.

87. ***Plumularia Catharina*** Johnst.

5 Kvml. SO. for Vestmanneyjar („Thor“, St. 163, 1903). 150 m., paa Ormerør (B. Sæm.). En Mængde Kolonier, med hanlige og hunlige Gonotheker.

Øvrige Udbr.: Nordamerikas Østkyst, Storbritannien, Nordsøen, Norges Vestkyst.

*88. ***Plumularia frutescens*** Ell.-Sol.

9 Kvml. SSO. af Vestmanneyjar („Thor“, St. 168, 1903), 510 m., paa *Oculina* (B. Sæm.). Mange kraftige, indtil 7 cm. høje Kolonier.

Øvrige Udbr.: Norges Vestkyst, Shetland, Storbritannien, sydlige Indiske Hav (Kerguelen m. m.).

11. Fam. **Aglaopheniidæ.**

*89. ***Thecocarpus radicellatus*** Sars.

Vestmanneyjar („Thor“, St. 163, 1903), 130 m. (B. Sæm.); en 15 cm. høj Koloni, uden Gonotheker. — 32 Kvml. S. af Selvogstangar („Thor“, St. 176, 1904), 178 m. (B. Sæm.); en 4 cm høj Koloni, med „Corbula“, men uden Gonotheker.

Øvrige Udbr.: Nordamerikas Østkyst, Færøerne, Norges Vestkyst, Storbritannien, Middelhavet (Neapel), Stille Hav.

90. ***Cladocarpus Holmii*** Levinsen.

Se nærmere Forf. [35], S. 70.

Der vilde maaske være Grund til her at give en Oversigt over Hydroidernes horizontale og vertikale Udbredning ved Island, men da der endnu savnes Materiale fra Nord- og Nordøstkysten, og da flere af Arterne endnu trænger til en Revision m. H. t. deres Begrænsning (og muligvis ogsaa til deres rigtige Bestemmelse), saa anser jeg det for rigtigst at lade dette vente en Tid endnu, især da jeg har Haab om i en nær Fremtid at faa hele det islandske Materiale revideret.

Jeg anstillede i mit forrige Arbejde [35], S. 72—73 en kort Sammenligning mellem Islands og Nabolandenes Hydroidfauna og fremhævede, at den særlig slutter sig til den nord- og vesteuropæiske, især til Storbritanniens. De i dette Arbejde anførte nye Arter (Broch's indbefattet) gør ingen væsentlig Forandring i denne Henseende; de fleste af dem er fælles for Storbritannien, Nordatlanterhavet, Norge og Island. Af de for Tiden ved Island kendte 91 Arter forekommer de 65 ved Storbritannien, 61 ved Norge, 40 ved Grønland og 28 ved Nordamerikas Østkyst. — Den islandske Hydroidfauna er, ligesom den islandske Havfauna i det hele taget, en Blanding af atlantiske (kosmopolitiske), subarktiske

(boreale) og arktiske Former, hvad der er en naturlig Følge af de hydrografiske Forhold; men det skal jeg ikke komme nærmere ind paa denne Gang.

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[1]) Fejlagtigt i Stedet for Greenland.

Om Forekomsten af en Fugleedderkop, *Atypus piceus* (Sulz). L. Koch, i Danmark.

Af

J. P. Kryger.

I Afhandlingen „Danmarks, Færøernes og Islands Edderkopper" af Dr. W. Sørensen (Entomologiske Meddelelser, 2. Række, 1. Bind, Side 252), meddeles, at de nordligste Steder her i Europa, hvor Fugleedderkopper indtil Aar 1900 var tagne, var Sydengland, preuss. Rhinprovinz, Holland og Volhynien. Dr. Sørensen tilføjer, at han alligevel nærede Haab om, at de ogsaa skulde forekomme her i Landet, navnlig i Jylland, og at han derfor havde bedt afdøde Konservator Løvendal lægge Mærke til, om han paa sine Udflugter muligvis skulde træffe paa saadanne Rørspind, der kunde antages at stamme fra Fugleedderkopper. Konservator Løvendal og B. G. Rye var ogsaa saa heldige, da de i Pintsen 1900 samlede paa Slotslyngen ved Hammeren, at faa fat i en Hun af *Atypus piceus* (Sulz.) L. Koch. Rørspindet med Dyret fulgte med en Tot Lav, som Hr. Rye trak op.

Den 18. Septbr. 1910 var jeg paa en Samleudflugt til Hareskoven og gik fra Hovedvejens Krydsning med Slangerupbanen langs det Stengærde, der fører Vest paa og danner Hareskovens Sydgrænse. Det meste af dette Gærde er dækket for Solen enten af Huse, der ligger paa Marken udenfor, eller af Træer, der vokser

paa og ved Gærdet. Omtrent midtvejs mellem Hovedvejen og det Sted, hvor Gærdet støder op til Vejen fra Hjortespring, er der imidlertid et Stykke, som ligger helt frit, i klart Vejr badet i fuldt Sollys. Da jeg søgte paa dette Stykke af Gærdet, blev jeg opmærksom paa, at der paa Undersiden af en af de store Sten i Gærdet sad et 4—5 cm. langt poset Spind, der var helt dækket af Sandskorn. Da jeg prøvede at løsne det, viste det sig, at det kun var det yderste af et længere Spind, der fortsattes ind mellem et Par store Stene. Det var umuligt at faa Spindet, der var ca. 1/3 m. langt, helt ud, idet Stenene paa det sidste Stykke laa ganske tæt op ad hinanden, og Spindet var godt befæstet mellem Smaarødder inde i Gærdet. — Ved et nøjere Eftersyn af Gærdet fandtes der ikke faa lignende Poser siddende paa Undersiden af Stenene stedse i Nærheden af Gærdets Fod. Det lykkedes mig at faa et Par Rør gravede frem, fordi en enkelt Sten kunde løftes ud af sit Leje, hvorved Jorden bagved blev helt fri. Ejerne af Rørene viste sig at være Edderkopper, som Dr. W. Sørensen havde den Godhed at bestemme. Det var Fugleedderkopper af Arten *Atypus piceus* (Sulz) L. Koch.

Jeg har senere flere Gange undersøgt længere Strækninger af Gærdet meget omhyggeligt, men stedse kun fundet de karakteriske Poser paa det solbeskinnede Stykke.

Ved Naturhistorisk Forenings Udflugt til Hareskoven 30/10 1910 blev der fremtaget et Rør med dets Beboer. Rørets fritliggende Ende var tilspundet, formodentlig fordi Dyret sov Vintersøvn.

Paa zoologisk Museum staar i den danske Edderkoppesamling et Glas mærket Tarentula sp.? Dette Glas indeholder et ca. 15 cm. langt Stykke af et Spind, der utvivlsomt tilhører en Fugleedderkop. Lærer C. Larsen, København; der har foræret Museet Spindet, meddeler, at han har taget det paa den af Entomologerne velkendte sandede Vej i Gels Skov den 5/5 1900. Han rev en Tot Lav og lign. op fra Jorden og Spindet fulgte med. Det nederste Stykke af Røret med Beboeren er imidlertid blevet siddende i Jorden, saa at det har været vanskeligt at bestemme, hvor det

hørte hen, især da man paa det Tidspunkt paa Museet ikke turde antage, at der fandtes Fugleedderkopper i Danmark. Spindet ligner ganske de af mig fundne, og da *Atypus piceus* nu er funden paa Bornholm og i Hareskoven, vil det vel være rimeligt at antage, at det i Gels Skov fundne Rør ogsaa tilhører denne Art. Formodentlig vil den vise sig at være mere udbredt her i Landet.

28.—4.—1911.

Fuglene ved de danske Fyr i 1910.

28de Aarsberetning om danske Fugle.

Ved

Herluf Winge.

Med et Kort.

I 1910 indsendtes fra 31 af de danske Fyr til Zoologisk Museum 1307 Fugle af 77 Arter faldne om Natten i Træktiden. I det hele var der faldet over 2500 Fugle.

De Fyr, hvorfra Fugle indsendtes, vare: *Vyl* Fyrskib, J. S. Jensen Fører (Sendinger fra 38 Nætter); *Horns Rev* Fyrskib, H. Sonnichsen Fører (13); *Lyngvig*, P. Larsen Fyrmester (36); *Lodbjerg*, P. S. Pedersen Fyrmester (13); *Hanstholm*, H. Roed Fyrmester (5); *Rubjerg Knude*, J. C. Boysen Fyrmester (2); *Skagen*, S. U. Hansen Fyrmester (6); *Skagens Rev* Fyrskib, A. P. Jensen Fører (2); *Læsø Trindel* Fyrskib, P. V. Eriksen Fører (15); *Læsø Rende* Fyrskib, P. C. Grumsen Fører (10); *Østre Flak* Fyrskib, C. Knudsen Fører (28); *Anholt Knob* Fyrskib, Th. Andresen Fører (17); *Anholt*, J. P. Nielsen Fyrmester (6); *Schultz's Grund* Fyrskib, P. Larsen Fører (4); *Hjelm*, A. P. Jensen Fyrmester (1); *Sejrø*, A. M. Dam Fyrmester (5); *Vestborg*, P. F. Køhler Fyrmester (1); *Lappegrund* Fyrskib, J. C. Jensen Fører (1); *Drogden* Fyrskib, N. Kromann Fører (4); *Stevns*, L. Wedén Fyrmester (9); *Sprogø*, A. V. Hansen Fyrmester (6); *Omø*, A. T. Friis Fyrmester (6); *Hov*, H. V. O. Westermann Fyrmester (2); *Kjels Nor*, J. C. Ryder Fyrmester

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(14); *Æbelø*, E. Schønfeldt Fyrmester (3); *Skjoldnæs*, J. H. S. Deichmann Fyrmester (1); *Hammeren*, E. Wielandt Fyrmester (5); *Dueodde Nordfyr*, W. Lund Fyrmester (1); *Gjedser*, Chr. Lindgaard Fyrmester (3); *Gjedser Rev* Fyrskib, J. Jensen Fører (9); *Hyllekrog*, P. W. Sørensen Fyrmester (6).

De Fugle, der indkom, vare:

1. *Anas penelops* 1.
2. *Anas boscas* 2.
3. *Tadorna cornuta* 2.
4. *Fuligula ferina* 1.
5. *Pagonetta glacialis* 1.
6. *Oedemia nigra* 2.
7. *Colymbus septentrionalis* 1.
8. *Procellaria pelagica* 1.
9. *Crex pratensis* 1.
10. *Porzana maruetta* 1.
11. *Rallus aqvaticus* 7.
12. *Gallinula chloropus* 1.
13. *Fulica atra* 3.
14. *Vanellus cristatus* 10.
15. *Charadrius sqvatarola* 5. (9 faldt.)
16. *Charadrius pluvialis* 3.
17. *Eudromias morinellus* 2.
18. *Ægialitis hiaticula* 3.
19. *Hæmatopus ostreologus* 2.
20. *Numenius arqvatus* 4. (6 faldt.)
21. *Limosa lapponica* 1.
22. *Actitis hypoleuca* 4.
23. *Totanus glareola* 1.
24. *Tringa maritima* 1.
25. *Tringa canutus* 2.
26. *Tringa alpina* 8.
27. *Limnocryptes gallinula* 14.
28. *Gallinago scolopacina* 2.

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29. *Scolopax rusticula* 5.
30. *Falco peregrinus* 1.
31. *Columba palumbus* 3.
32. *Cypselus apus* 3.
33. *Cuculus canorus* 4.
34. *Iynx torqvilla* 3.
35. *Corvus monedula* 1.
36. *Corvus frugilegus* 1.
37. *Alauda arborea* 1.
38. *Alauda arvensis* 239. (Mindst 539 faldt.)
39. *Sturnus vulgaris* 118. (Mindst 257 faldt.)
40. *Troglodytes parvulus* 3.
41. *Cinclus aqvaticus* 1.
42. *Parus major* 1.
43. *Sylvia cinerea* 4.
44. *Sylvia curruca* 5.
45. *Sylvia atricapilla* 6.
46. *Sylvia hortensis* 39.
47. *Hypolais icterina* 1.
48. *Acrocephalus arundinaceus* 2.
49. *Acrocephalus phragmitis* 6.
50. *Phyllopseustes trochilus* 81.
51. *Phyllopseustes rufus* 3.
52. *Regulus cristatus* 19.
53. *Anthus pratensis* 6.
54. *Anthus obscurus* 2.
55. *Anthus arboreus* 7.
56. *Motacilla flava* 3.
57. *Turdus iliacus* 91. (Mindst 420 faldt, nogle Sangdrosler maaske medregnede.)
58. *Turdus musicus* 113. (Mindst 140 faldt.)
59. *Turdus viscivorus* 3.
60. *Turdus pilaris* 53. (Mindst 94 faldt.)
61. *Turdus torqvatus* 2.

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62. *Turdus merula* 44. (Mindst 53 faldt.)
63. *Saxicola oenanthe* 43.
64. *Praticola rubetra* 5.
65. *Ruticilla phoenicura* 86. (90 faldt.)
66. *Erithacus rubecula* 62. (74 faldt.)
67. *Cyanecula suecica* 1.
68. *Muscicapa atricapilla* 60.
69. *Muscicapa grisola* 1.
70. *Fringilla coelebs* 4.
71. *Fringilla montifringilla* 37.
72. *Chrysomitris spinus* 2.
73. *Cannabina linaria* 21.
74. *Emberiza schoeniclus* 11.
75. *Emberiza hortulana* 3.
76. *Emberiza citrinella* 2.
77. *Emberiza nivalis* 9.

Af de faldne Arter var der ingen, der ikke tidligere var falden ved Fyrene.

Aaret begyndte med mildt Vejr, og 7de Januar var den første Stær (*Sturnus vulgaris*) at se ved Kjøbenhavn*). Maaske har det dog snarest været en Efternøler, der ikke havde været rigtig bortrejst; skjønt den fuldt vel var istand til at flyve, var der dog noget galt ved den ene Vinge, som den altid lod hænge lidt, naar den sad. Den var jevnlig at se i Egnen i den følgende Tid, helt ind i Foraaret. Men først 20de Februar viste sig enkelte andre. I de nærmest følgende Dage kom flere, og endnu flere i de første Dage af Marts.

Indtil 20de Januar var det næsten stadig Tøvejr; derefter kom nogle Dage med Frost. 21de Januar i Tusmørke om Morgenen hørtes en Lærke (*Alauda arvensis*) flyvende ind fra Sundet mod

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*) De efterfølgende Meddelelser om Fugle ved Kjøbenhavn ere efter mine egne Iagttagelser.

(1910.)

V., sikkert paa Tilbagevej fra Sverig. 18de Februar, første Dag med fremtrædende mildt Vejr, vare flere Lærker paa Vandring, og 20de Februar sang adskillige over Markerne. Lidt Vandring iagttoges igjen 6te Marts, en enkelt flyvende over Sundet lige mod Ø. om Formiddagen, og 13de Marts, 2 flyvende Ø.

23de Januar i Snevejr fløj omtrent 20 Vindrosler (*Turdus iliacus*) i Flok over Stranden mod S. om Morgenen. Sidste Gang i Foraaret blev Arten set 28de Marts, nogle faa sammen.

7de Marts kom Irisken (*Cannabina linota*) til et Ynglested.

10de Marts blev første Vibe (*Vanellus cristatus*) set, flyvende lige mod Ø. ud over Sundet Kl. 7,20 Fm., og samme Morgen vandrede flere Alliker og Krager (*Corvus monedula, C. cornix*) mod Ø. En Vibe, der sikkert var paa Vandring, blev set 8de Maj, højt tilvejrs, flyvende lige mod N. om Morgenen. 13de Marts trak en Flok Alliker N.

11te Marts var Sangdroslen (*Turdus musicus*) at høre syngende paa 2 Steder, og i de nærmest følgende Dage var den kommen til flere Ynglesteder i Egnen. Paa Vandrested var den at se endnu i de sidste Dage af April og igjen 7de Maj.

13de Marts sang Rørspurven (*Emberiza schoeniclus*) ved et Ynglested.

18de Marts var Fuglekongen (*Regulus cristatus*) paa Vandrested, ligeledes 27de Marts, 4de, 7de, 12te, 13de og 14de April.

29de Marts vandrede en Spurvehøg (*Accipiter nisus*) mod N. Kl. 5,15 Em., 3dje April om Morgenen ligeledes en mod N. Ø.

3dje April trak en lille Flok Bogfinker (*Fringilla coelebs*) N. Ø. om Morgenen. Det var vel nærmest tilfældigt, at de ikke ellers bleve sete vandrende om Foraaret. Mange havde overvintret som ellers.

7de April blev første Hvide Vipstjert (*Motacilla alba*) set.

18de April hørtes Storspover (*Numenius arqvatus*) fløjtende over Sundet om Aftenen Kl. 10,35, i stille, skyet Vejr, og „Gyvfugle“ (Sortænder, *Oedemia nigra*) hørtes oftere mellem Kl. 10,35 og 11,5. 19de April om Aftenen mellem Kl. 10,45 og 11, i klart Maaneskin, hørtes Gyvfugle igjen flere Gange.

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19de April var Gransangeren (*Phyllopseustes rufus*) paa Vandrested.

23de April vandrede en Fiskeørn (*Pandion haliaëtus*) langsomt mod N.V. Kl. 1,45, og den første Munk (*Sylvia atricapilla*) viste sig.

25de April var Rødkjælken (*Erithacus rubecula*) for sidste Gang paa Vandrested. Nogle havde overvintret.

Løvspringet kom ualmindelig tidlig; men de Trækfugle, der pleje at følge det, vare slet ikke særlig tidlig paafærde. Først 27de April viste sig de første to Forstuesvaler og den første Løvsanger (*Hirundo rustica*, *Phyllopseustes trochilus*). 3dje Maj blev igjen et Par Forstuesvaler set, 5te ligeledes, 6te 3 sammen, 10de mindst 4, 11te 3, 14de og 15de en enkelt, 16de mindst 4, 17de og 18de adskillige. 30te April viste Løvsangeren sig næste Gang, 1ste Maj vare flere komne, og paa Vandrested var den derefter næsten stadig indtil 23de Maj og igjen 1ste Juni.

30te April var her den første Rødstjert (*Ruticilla phoenicura*), 8de, 9de, 10de og 19de Maj viste sig de næste, alle Hanner; fra 22de til 24de Maj var en Hun paa Vandrested; 27de Maj blev den set sidste Gang paa Gjennemrejse.

1ste Maj kom Gjerdesangeren (*Sylvia curruca*). 4de Maj indfandt den sig ved et Ynglested.

2den Maj var her første Skovpiber (*Anthus arboreus*). Paa Vandrested var den igjen 15de, 20de og 23de Maj.

3dje Maj vare 2 Grønne Løvsangere (*Phyllopseustes sibilatrix*) tilstede paa Ynglesteder. 14de Maj var den paa Vandrested.

4de Maj iagttoges første Sivsanger, Gul Vipstjert og Bynkefugl (*Acrocephalus phragmitis*, *Motacilla flava*, *Praticola rubetra*).

10de Maj vare sidste Kvækere (*Fringilla montifringilla*) paa Vandrested. De havde overvintret her i stor Mængde.

12te Maj bleve de første to Bysvaler (*Hirundo urbica*) sete. 18de Maj fløj 6 mod N. Kl. 6,40 Fm. Kun yderst faa indfandt sig i Egnen.

13de Maj blev første Digesvale (*Hirundo riparia*) set,

15de Maj ligeledes første Graa Fluesnapper (*Muscicapa grisola*).

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16de Maj var her Gjøg og Nattergal (*Cuculus canorus*, *Luscinia philomela*).

17de Maj blev første Mursvale (*Cypselus apus*) set, og adskillige Brogede Fluesnappere (*Muscicapa atricapilla*) vare tilstede paa Ynglesteder. Nogle faa Mursvaler bleve sete 19de og 27de Maj; først 2den Juni viste de sig i Flok. Ganske mod Sædvane havde ingen Broget Fluesnapper været at se paa Vandrested.

22de Maj var her Havesanger, Gulbug og Rørsanger (*Sylvia hortensis*, *Hypolais icterina*, *Acrocephalus arundinaceus*).

23de Maj, i stille, klart Vejr, hørtes Mudderkliren (*Actitis hypoleuca*) flyvende over Sundet om Aftenen Kl. 9,15. 27de Maj hørtes den over Sundet Kl. 5,35 Em.

24de Maj var her første Tornskade (*Lanius collyrio*), en Han.

25de Maj var her Drosselrørsanger (*Acrocephalus turdinus*),

26de Maj ligeledes første Tornsanger (*Sylvia cinerea*).

27de Maj var en Natravn (*Caprimulgus europæus*) paa Vandrested.

29de Maj, paa en Udflugt til Nykjøbing paa Falster, iagttoges nogle faa Hvepsevaager (*Pernis apivorus*) vandrende Nord, følgende Retningen af Gjedser Odde, om Eftermiddagen, 2, 2 og 3 sammen.

Allerede 24de Juni indvarsledes Efteraaret af Mudderkliren; om Aftenen Kl. 10,10, i stille, klart Vejr, hørtes den flyvende over Sundet. Derefter blev den dog ikke set førend 23de Juli, da en enkelt viste sig paa Vandrested; men i den følgende Tid indtil 16de September var den ganske almindelig, enkeltvis og i Smaaflokke, at se om Dagen eller at høre om Natten.

1ste Juli hørtes Storspoven flyvende S. over Sundet Kl. 11,40 Fm. i Bygevejr. 2den Juli hørtes den ligeledes om Aftenen Kl. 9,50, i stille, klart Vejr, 3dje Juli Kl. 6,50 Fm. og 2,30 Em., i skyet Vejr, 26de Juli Kl. 9,37 Aften, i skyet Vejr, og 2den August Kl. 6,34 Morgen.

7de Juli viste Løvsangeren sig første Gang paa Vandrested i Efteraaret, men derefter ikke førend 15de August; i den følgende Tid var den derimod meget jevnlig at se indtil 15de September.

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29de Juli kom en ung Tornskade paa Vandrested.

30te Juli om Aftenen Kl. 9,37 hørtes Rylen (*Tringa alpina*) flyvende over Sundet. 10de Oktober fløj en enkelt S. om Formiddagen.

1ste August i Skumringen om Aftenen Kl. 8,50, i stille, diset Vejr med overtrukken Himmel, kom en stor Flok „Gyvfugle“, tavse, men nogenlunde kjendelige paa deres ejendommelige hvislende Vingeslag, flyvende over Sundet mod S.; Flokken kunde netop skimtes mod den lyse Himmel som en mørk, uhyre Bue; det samme hørtes Kl. 9,12; 9,15; 9,20; 9,30; 9,33; maaske vare Flokkene paavirkede af elektrisk Lys, hvormed der holdtes Øvelser ude i Sundet, paa Middelgrunden. 3dje August Kl. 6,30 Aften, i stille Vejr med letskyet Himmel, kom en Flok Sortænder (*Oedemia nigra*) paa mellem 100 og 200 flyvende fra Nord, højt, ude over Sundet; en Tid lang fløj Flokken videre lige mod Syd, men vendte derefter tilbage mod Nord, svingede flere Gange mod Øst og Vest for tilsidst igjen at gaa mod Syd og forsvinde; stadig skiftede Flokken Form; undertiden fløj de fleste af Fuglene i en enkelt næsten lige Linie, undertiden opløstes Flokken i mindre, mere eller mindre V-formede Afdelinger, undertiden samledes den mere i Klumpform eller i en mægtig Bue; en enkelt Gang svingede Flokken næsten helt ind over Kysten, hen over mit Hoved, og et Øjeblik hørtes den hvislende, fløjtende Lyd af Vingeslagene, og et Par Gange lød den velkjendte Stemme gyv gyv ned fra Luften. Omtrent 5 Minutter var Flokken at se, i fortrinligt Lys, og næsten hele Tiden holdt jeg den i stærk Kikkert; om Artbestemmelsen af de helt sorte Ænder kunde der ingen Tvivl være. Elev Peter Bang var den, der opdagede Flokken. — Det var første Gang, at jeg havde Lejlighed til at se „Gyvfugle“; jeg kjendte dem hidtil kun efter Stemmen; for mig var det dermed klaret, at Gyvfugle i hvert Fald kunne være Sortænder, som det tidligere var gjettet. Det er ikke sandsynligt, at nogen anden Art skulde kunne have ganske den samme Stemme; men meget muligt er det, at baade Fløjlsand og andre kunne have Stemmer, der minde om denne. (Spørgsmaalet

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har været drøftet i A. H. Faber's „Optegnelser om Vejle- og Horsensegnens Fuglefauna", 1898, S. 62, i Vidensk. Medd. for 1903, S. 337, og i Dansk Ornithologisk Forenings Tidsskrift, 2den Aarg., 1907—8, flere Steder, og 3dje Aarg. 1908—9, flere Steder.)

4de August forlod Gulbugen et Ynglested. 1ste September blev den set sidste Gang.

6te August vare Rørsanger og Broget Fluesnapper paa Vandrested. 23de August viste den Brogede Fluesnapper sig næste Gang, og derefter var den jevnlig at se indtil 17de September.

15de August blev den første Engpiber (*Anthus pratensis*) set vandrende, flyvende S. V. om Morgenen. Først 3dje September viste den sig igjen vandrende, derefter den 11te og 14de, og i den følgende Tid var den almindelig at se flyvende S. og S. V. om Morgenen, enkeltvis og i Smaaflokke, indtil 10de Oktober; 16de Oktober blev endnu en enkelt set flyvende S.

18de August blev en Præstekrave (*Ægialitis hiaticula*) hørt flyvende over Sundet om Morgenen.

19de August kom Rødstjerten paa Vandrested, og den var igjen at se den 20de, men derefter ikke førend 1ste September, da adskillige indfandt sig. I den følgende Tid var den næsten stadig at se, flere eller færre, indtil 23de September.

20de August var den første Rødkjælk paa Vandrested, en ung Fugl i endnu spettet Dragt. 21de var ogsaa en voxen Fugl paa Vandrested. Derefter var Arten næsten stadig tilstede hele Efteraaret igjennem, og nogle overvintrede.

22de August var Sangdroslen paa Vandrested og var derefter meget jevnlig at se indtil 16de Oktober.

25de August Kl. 6,35 Morgen trak 4 Mursvaler mod S., lidt senere viste sig en højtflyvende Flok paa mindst 33, der en Tid sværmede rundt, men vist derefter ogsaa gik S., og Kl. 6,45 fløj 7 mod S.; omtrent 10 Gule Vipstjerter i Flok gik S. Kl. 6,45. Ved Midten af August vare Egnens Mursvaler forsvundne; 27de August blev endnu en enkelt set flyvende S. om Eftermiddagen. 5te September bleve de sidste Gule Vipstjerter sete.

(1910.)

29de August var en Munk paa Vandrested. 5te September viste Arten sig igjen, 2 sammen, og i den følgende Tid var den ret jevnlig tilstede indtil 25de September; 16de og 17de Oktober var den paany at se.

3dje September om Morgenen var en større Forsamling Svaler paa Vandrested; omtrent 50 Forstuesvaler og adskillige Bysvaler og Digesvaler sad i Rader paa Telefontraade, og adskillige andre fløj omkring. Lignende Forsamlinger vare jevnlig at se i den følgende Tid om Morgenen: 5te September omtrent 200 Forstuesvaler, 10de omtr. 70, 12te igjen en større Flok, 17de ligeledes, 18de mindst 325, 19de omtr. samme Tal, 20de ogsaa mange, 22de omtr. 300, 23de neppe halvt saa mange som den foregaaende Dag, 24de igjen mange, 25de mindst 230 siddende, men adskillige andre flyvende omkring, 26de et lignende Tal, 27de adskillige, 28de mindst 50 siddende og andre flyvende rundt; de mellemliggende Dage vare kun ret faa at se, og efter Oktobers Begyndelse svandt Tallet stærkt; dog kunde endnu sees Smaaflokke, saaledes 4de Oktober omtr. 40 i Flok, 7de mindst 16, 8de mindst 22, 10de mindst 10, 11te ligeledes; indtil 13de var Arten daglig at se, derefter kun med Afbrydelser og kun enkeltvis eller nogle faa sammen: 15de, 16de, 18de, 19de, 20de; 30te en ung Fugl; 31te 3 unge; 2den November fløj en ung langsomt mod S. Kl. 4,25 Em.; 3dje November fløj 2 unge omkring over Strandbredden stadig om Eftermiddagen; 5te November 2 unge ligeledes. Jeg har ikke selv oplevet at se Svaler i November siden 1872, da enkelte Forstuesvaler og Bysvaler fløj omkring over Strandenge ved Kjøbenhavn 1ste og 2den November. — En Del Bysvaler vare jevnlig at se i Forstuesvalernes Flokke indtil 18de September, Digesvaler ligeledes indtil 23de, i forholdsvis større Mængde den 5te.

3dje September var ogsaa en Fuglekonge paa Vandrested, igjen 9de, 12te, 14de, 18de, 19de, 22de, 24de, 27de September, 3dje Oktober og oftere senere. Nogle overvintrede.

5te September bleve Tornsanger, Gjerdesanger, Sivsanger og Skovpiber sete sidste Gang, alle undtagen Gjerdesangeren paa Vandrested.

(1910.)

9de September om Morgenen vandrede en Spurvehøg S.

12te September bleve Havesanger og Graa Fluesnapper sete sidste Gang.

20de September trak en enkelt Lærke mod S., en enkelt Sisken (*Chrysomitris spinus*) ligeledes. Nogle faa trækkende Lærker iagttoges igjen 30te September, 7de, 9de og 14de Oktober; 16de November blev Lærken set sidste Gang, 2 sammen. Siskenen blev set ret jevnlig i den følgende Tid indtil 12te Oktober trækkende S. om Morgenen enkeltvis eller i Smaaflokke; nogle faa bleve her for Vinteren.

21de September kom Gjerdesmutten (*Troglodytes parvulus*) paa Vandrested.

22de September trak en Skovskade (*Garrulus glandarius*) mod S. om Morgenen.

25de September hørtes Kvækere i Luften om Morgenen for første Gang i Efteraaret. Kun nogle faa Gange senere i September og i Løbet af Oktober blev den ellers iagttagen, og neppe nogen var at se her i Vinteren, ganske i Modsætning til Vinteren forud.

27de September blev den første Flok Irisker set vandrende S. om Morgenen. Oftere var det samme at se i Oktober indtil den 18de.

7de Oktober fløj 5 Sangsvaner (*Cygnus musicus*) i Flok, syngende mod V. Kl. 3,15 Em. Samme Dag blev den Hvide Vipstjert set sidste Gang.

8de Oktober om Morgenen fløj en lille Flok Bogfinker S., ligeledes 18de Oktober og flere den 5te November. Mange overvintrede.

11te Oktober trak et Par Smaaflokke Svensker (*Ligurinus chloris*) mod S. om Morgenen. 18de Oktober, 5te, 6te og 13de November bleve igjen Smaaflokke sete vandrende. Mange overvintrede.

14de Oktober viste sig den første Dompap (*Pyrrhula vulgaris*) i Efteraaret. 23de vare 3 tilstede sammen, og i den følgende Tid, Aaret ud, vare Dompapper meget almindelig at se i Smaaflokke.

(1910.)

15de Oktober svømmede 28 Knortegjæs (*Anser torqvatus*) i Stranden.

1ste November blev Graasiskenen (*Cannabina linaria*) set første Gang, 2 flyvende S. I første Halvdel af November var den ofte at se vandrende S. især om Morgenen, saaledes i store Flokke den 3dje, 9de og 13de. Aaret ud var den almindelig i Egnen.

3dje November var Sjaggeren (*Turdus pilaris*) paa Vandrested.

21de November blev Stæren set sidste Gang, 8 i Flok. Siden 2den November havde ellers ingen været at se, og efter Midten af Oktober havde de fleste været forsvundne.

25de November vare 7 Halemejser (*Acredula caudata*) i Flok paa Vandrested, vist lige komne i Land fra Øresund, derefter vandrende langsomt mod V. gjennem Haverne.

14de December var en Silkehale (*Ampelis garrula*) paa Vandrested.

27de December var en Rørspurv (*Emberiza schoeniclus*) tilstede ved et Ynglested, vel som overvintrende.

Fortegnelse over de Fugle der ere indsendte fra Fyrene som faldne om Natten.

(Hver Nat dateret som den følgende Dag.)

1. ***Anas penelops.*** Pibeand.
   Oktober: 13de Lodbjerg 1.
2. ***Anas boscas.*** Stokand.
   Marts: 19de Lyngvig 1 ♂.
   November: 12te Dueodde Nordfyr 1 ♀.
3. ***Tadorna cornuta.*** Gravand.
   Marts: 16de Omø 2 (♂, ♀).
4. ***Fuligula ferina.*** Taffeland.
   November: 7de Lyngvig 1.
5. ***Pagonetta glacialis.*** Havlit.
   Marts: 12te Kjels Nor 1 ♂ ad.

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6. *Oedemia nigra.* Sortand.

September: 30te Skagen 2 (♂, ♀).

7. *Colymbus septentrionalis.* Rødstrubet Lom.

December: 11te Læsø Rende 1.

8. *Procellaria pelagica.* Stormsvale.

November: 11te Skagens Rev 1.

9. *Crex pratensis.* Engsnarre.

August: 16de Lyngvig 1.

10. *Porzana maruetta.* Rørvagtel.

September: 15de Lyngvig 1.

11. *Rallus aqvaticus.* Vandrixe.

Januar: 30te Æbelø 1.

April: 6te Stevns 1.

September: 11te Lyngvig 1.

Oktober: 10de Skjoldnæs 1. 13de Lyngvig 1. 25de Sejrø 1. 29de Sejrø 1.

12. *Gallinula chloropus.* Rørhøne.

Oktober: 31te Kjels Nor 1.

13. *Fulica atra.* Blishøne.

Januar: 30te Lodbjerg 1.

Oktober: 29de Vyl 1.

December: 6te Omø 1.

14. *Vanellus cristatus.* Vibe.

Februar: 14de Lyngvig 1. 19de Kjels Nor 1.

Marts: 8de Lyngvig 1, Lodbjerg 1, Hanstholm 2. 16de Kjels Nor 2.

April: 6te Stevns 1.

September: 5te Sprogø 1 jun.

15. *Charadrius sqvatarola.* Strandhjejle.

August: 5te Lyngvig 1. 6te Hanstholm 1. 7de Lyngvig 1. 14de Stevns 1.

September: 11te Rubjerg Knude 1 (5 faldt)*).

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*) Tallet paa de faldne Fugle er vedføjet efter Fyrmestrenes Oplysninger, naar det er et andet end Tallet paa de indsendte. Skovsneppe, Lærke og Stær opføres ogsaa efter Fyrmestrenes Opgivelser, selv om intet er indsendt, dog kun i ( ).

(1910.)

16. *Charadrius pluvialis.* Hjejle.

August: 7de Lyngvig 1. 13de Lyngvig 1.

September: 30te Lyngvig 1.

17. *Eudromias morinellus.* Pomeransfugl.

September: 7de Stevns 2.

18. *Ægialitis hiaticula.* Præstekrave.

Marts: 8de Hanstholm 1. 20de Lyngvig 1.

August: 16de Lyngvig 1.

19. *Hæmatopus ostreologus.* Strandskade.

August: 5te Lyngvig 1.

September: 10de Lyngvig 1.

20. *Numenius arqvatus.* Storspove.

August: 5te Lyngvig 1 (3 faldt). 7de Lyngvig 1. 13de Lyngvig 1. 16de Lyngvig 1.

21. *Limosa lapponica.* Kobbersneppe.

August: 13de Sejrø 1.

22. *Actitis hypoleuca.* Mudderklire.

August: 1ste Lyngvig 1. 5te Lyngvig 1. 14de Sejrø 1.

September: 5te Vestborg 1.

23. *Totanus glareola.* Tinksmed.

August: 8de Lyngvig 1.

24. *Tringa maritima.* Sortgraa Ryle.

Oktober: 29de Anholt 1.

25. *Tringa canutus.* Islandsk Ryle.

August: 7de Lyngvig 1.

September: 1ste Lyngvig 1 jun.

26. *Tringa alpina.* Ryle.

Marts: 8de Lodbjerg 2. 10de Lyngvig 1.

April: 15de Sprogø 1. 23de? Stevns 1.

August: 7de Lyngvig 1.

September: 10de Lyngvig 1.

Oktober: 11te Gjedser 1.

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27. *Limnocryptes gallinula.* Enkelt Bekkasin.

September: 10de Lyngvig 1. 11te Vyl 1. 15de Rubjerg Knude 1. 28de Lyngvig 1. 30te Vyl 1, Lyngvig 1.

Oktober: 12te Lodbjerg 2. 13de Lodbjerg 1, Østre Flak 1.

November: 1ste Sprogø 1, Gjedser 1. 6te Østre Flak 1. 12te Horns Rev 1.

28. *Gallinago scolopacina.* Horsegjøg.

Maj: 6te Skagen 1.

Oktober: 12te Lyngvig 1.

29. *Scolopax rusticula.* Skovsneppe.

April: 14de Omø 1.

Oktober: 25de Sejrø 1. 29de Sejrø 1. 30te Kjels Nor 2.

30. *Falco peregrinus.* Vandrefalk.

Oktober: 30te Vyl 1 jun.

31. *Columba palumbus.* Ringdue.

Marts: 10de Anholt Knob 1.

November: 8de Æbelø 1.

December: 2den Kjels Nor 1.

32. *Cypselus apus.* Mursvale.

August: 13de Sejrø 1 jun. 16de Lyngvig 1. 30te Lodbjerg 1.

33. *Cuculus canorus.* Gjøg.

August: 13de Sejrø 1 jun.

September: 5te Sprogø 1 jun. 6te Kjels Nor 1, Gjedser Rev 1.

34. *Iynx torqvilla.* Vendehals.

April: 30te Østre Flak 1.

Maj: 6te Skagen 1, Anholt 1.

35. *Corvus monedula.* Allike.

Marts: 8de Vyl 1.

36. *Corvus frugilegus.* Raage.

Februar: 27de Vyl 1.

37. *Alauda arborea.* Hedelærke.

Marts: 10de Anholt 1.

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38. *Alauda arvensis.* Lærke.

Januar: 3dje Læsø Rende 1. 6te Lodbjerg 2, Æbelø 1 9de Læsø Rende 1. 16de Lyngvig 1.

Februar: 5te Sprogø 1 (3 faldt). 8de Sprogø 2. 11te Vyl 1. 12te Horns Rev 10. 13de Læsø Trindel 1. 14de Lyngvig 1, (Sprogø 1), Omø 2, Kjels Nor 7. 15de Gjedser Rev 4 (5 faldt). 16de Vyl 1, (Sprogø 2). 17de Østre Flak 3. 19de Østre Flak 5. 20de (Hanstholm 1), Anholt Knob 1. 24de Anholt Knob 1. 28de Østre Flak 4.

Marts: 1ste Østre Flak 1. 3dje Anholt Knob 2, Schultz's Grund 4. 4de Læsø Trindel 2. 5te Østre Flak 1. 7de Lyngvig 1. (8de Vestborg 2, Hammeren 1.) 9de Læsø Trindel 1. 10de Lodbjerg 1, Læsø Rende 1, Østre Flak 6, Anholt Knob 1, Anholt 4 (14 faldt). (11te Vestborg 2.) 12te Vyl 1, Skagen 5 (6 faldt), Læsø Rende 2, Østre Flak 1, Anholt Knob 1, Kjels Nor 1. 14de Læsø Trindel 2. 15de Omø 1. 16de Læsø Trindel 1, Kjels Nor 1. (27de Vestborg 1.)

April: 6te Anholt 1. 9de Østre Flak 1.

September: (9de Nordre Røn 1.) 13de Hammeren 1. 15de Lyngvig 1. (24de Nordre Røn 1.)

Oktober: 2den (Nordre Røn 1), Østre Flak 4 (10 faldt). 3dje Vyl 1, (Hanstholm 6). 5te Horns Rev 3. 6te Horns Rev 2, Stevns 4. 7de Gjedser Rev 2. 10de Horns Rev 29. 11te (Blaavands Huk 3), Vyl 7, Lyngvig 1 (28 faldt), Læsø Rende 1, Sejrø 1, (Vestborg 2), Kjels Nor 6, Hammeren 7, Gjedser 2, Gjedser Rev 12. 12te Vyl 2 (35 faldt), Lyngvig 1 (10 faldt), Lodbjerg 3, (Sprogø 1, Hammeren 1), Gjedser Rev 4. 13de Lyngvig 1, Lodbjerg 3, Østre Flak 1, Gjedser Rev 5. (25de Sejrø 2.) 26de Vyl 3, Horns Rev 4, Lyngvig 1. 27de Vyl 4, Horns Rev 13. 28de Vyl 1. 29de Horns Rev 2, Lyngvig 1 (14 faldt), Anholt 1, Gjedser Rev 3. 30te Vyl 2 (13 faldt), Horns Rev 4, Lyngvig 1 (147 faldt). (31te Romsø 2.)

November: 1ste Sprogø 1 (3 faldt), Kjels Nor 1. (2den Nordre Røn 1.) (5te Gjedser Rev 8.)

(1910.)

39. *Sturnus vulgaris.* Stær.

Februar: 12te Horns Rev 1. 17de Anholt Knob 1. 19de Østre Flak 1, Kjels Nor 1.

Marts: (4de Læsø Rende 1.) 8de Vyl 1, Horns Rev 1, Lyngvig 1, Lodbjerg 2. 10de Anholt 2 (12 faldt). 14de Schultz's Grund 1. 15de (Blaavands Huk 3), Vyl 2, Horns Rev 1, Læsø Trindel 1, (Omø 1). 16de Kjels Nor 1. 17de (Blaavands Huk 4), Vyl 3, Horns Rev 3, Lodbjerg 1, Drogden 1. 18de Stevns 2. 20de (Blaavands Huk 1), Hov 1.

April: 2den Østre Flak 1. 6te Østre Flak 2, Anholt 13 (22 faldt), (Sejrø 9), Stevns 12, Hyllekrog 1. 9de Østre Flak 3. (19de Gjedser Rev 1.) 29de Østre Flak 1.

(September: 9de Nordre Røn 2. 10de Nordre Røn 1.)

Oktober: 10de Horns Rev 2. 11te Hammeren 1. 12te Vyl 1. 13de Lyngvig 1 (12 faldt), Gjedser Rev 1. (20de Nordre Røn 1.) 24de Vyl 1. 25de Vyl 1, (Sejrø 2). 26de Vyl 3, Horns Rev 9, Lyngvig 1 (31 faldt). 27de Vyl 1, Horns Rev 4. 29de Vyl 1, Horns Rev 1, Stevns 1, Kjels Nor 1, Gjedser 1, Gjedser Rev 7, Hyllekrog 3. 30te Vyl 2 (6 faldt), Horns Rev 11, Lyngvig 1 (48 faldt), (Møen 1).

November: 1ste Vyl 1. (7de Sprogø 1.) 13de Vyl 1.

40. *Troglodytes parvulus.* Gjerdesmutte.

April: 5te Stevns 1.

Oktober: 5te Lyngvig 1. 15de Østre Flak 1.

41. *Cinclus aqvaticus.* Vandstær.

Oktober: 23de Østre Flak 1.

42. *Parus major.* Musvit.

Oktober: 15de Østre Flak 1.

43. *Sylvia cinerea.* Tornsanger.

September: 5te Anholt 1, Sprogø 1. 11te Hanstholm 2.

44. *Sylvia curruca.* Gjerdesanger.

September: 5te Anholt 1. 7de Stevns 4.

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45. *Sylvia atricapilla.* Munk.

September: 7de Stevns 2 (♂, ♀). 15de Lyngvig 1 ♂, Rubjerg Knude 1 ♀.

Oktober: 11te Kjels Nor 1 ♀. 30te Lyngvig 1 ♀.

46. *Sylvia hortensis.* Havesanger.

August: 8de Stevns 1. 16de Lyngvig 1. 30te Vyl 2, Lyngvig 1, Lodbjerg 1, Kjels Nor 4.

September: 1ste Hanstholm 2. 5te Anholt 3. 6te Kjels Nor 2. 7de Stevns 6. 10de Lyngvig 1. 11te Skagen 2. 13de Lodbjerg 1. 14de Lyngvig 1, Kjels Nor 3. 15de Horns Rev 5, Lyngvig 1, Rubjerg Knude 1. 28de Lodbjerg 1.

47. *Hypolais icterina.* Gulbug.

August: 7de Lyngvig 1.

48. *Acrocephalus arundinaceus.* Rørsanger.

Oktober: 6te Stevns 1. 11te Kjels Nor 1.

49. *Acrocephalus phragmitis.* Sivsanger.

August: 3dje Drogden 1. 8de Stevns 3.

September: 6te Kjels Nor 2.

50. *Phyllopseustes trochilus.* Løvsanger.

April: 15de Vyl 1.

Maj: 5te Læsø Trindel 1. 6te Anholt 3. 17de Vyl 1. 25de Vyl 1.

August: 8de Stevns 1. 30te Lodbjerg 1, Kjels Nor 8, Hyllekrog 17.

September: 1ste Hanstholm 1. 5te Anholt 10. 6te Læsø Trindel 1, Kjels Nor 3, Hammeren 1. 7de Stevns 21. 8de Læsø Trindel 2, Gjedser Rev 1. 11te Lyngvig 1, Skagen 2. 12te Anholt Knob 1. 14de Kjels Nor 3.

51. *Phyllopseustes rufus.* Gransanger.

Maj: 6te Anholt 2.

September: 30te Skagen 1.

52. *Regulus cristatus.* Fuglekonge.

April: 14de Østre Flak 1 ♀. 16de Vyl 1 ♀.

September: 14de Anholt Knob 1 ♂.

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Oktober: 6te Hyllekrog 2 (♂, ♀). 11te Sejrø 1 ♂. 14de Vyl 1 ♀. 15de Østre Flak 1 ♂, Anholt Knob 1. 16de Skagens Rev 2 (♂, ♀). 19de Læsø Trindel 1 ♂. 26de Lyngvig 1 ♂. 27de Lyngvig 1 ♀. 29de Lyngvig 1 ♂, Stevns 3 (1 ♂, 2 ♀).

November: 1ste Gjedser 1 ♂.

53. ***Anthus pratensis.*** Engpiber.

April: 17de Østre Flak 1.

September: 23de Vyl 1.

Oktober: 10de Horns Rev 1. 11te Vyl 1. 26de Vyl 1. 30te Vyl 1.

54. ***Anthus obscurus.*** Skjærpiber.

Oktober: 6te Horns Rev 1. 10de Horns Rev 1.

55. ***Anthus arboreus.*** Skovpiber.

Maj: 6te Anholt 1.

August: 30te Vyl 3, Kjels Nor 1.

September: 7de Stevns 2.

56. ***Motacilla flava.*** Gul Vipstjert.

August: 27de Hammeren 3.

57. ***Turdus iliacus.*** Vindrossel.

Februar: 5te Kjels Nor 1. 8de Østre Flak 1, Anholt Knob 1. 13de Schultz's Grund 1.

Marts: 8de Vyl 1. 10de Lyngvig 1, Østre Flak 1. 12te Læsø Rende 1. 16de Kjels Nor 1. 17de Vyl 2, Lodbjerg 1.

September: 28de Lyngvig 1.

Oktober: 5te Horns Rev 7. 6te Horns Rev 1, Lyngvig 1. 7de Lyngvig 1 (7 faldt). 10de Horns Rev 3. 11te Vyl 3, Lyngvig 1 (120 faldt), Kjels Nor 2, Gjedser 2, Gjedser Rev 1. 12te Vyl 1, Gjedser Rev 3. 13de Østre Flak 3. 26de Vyl 2, Lyngvig 1 (49 faldt). 27de Vyl 2, Horns Rev 2, Lyngvig 1. 28de Lodbjerg 2. 29de Vyl 1 (12 faldt), Lyngvig 1 (52 faldt), Lodbjerg 2, Skagen 2, Anholt 3 (34 faldt), Hjelm 1, Sejrø 1, Stevns 1, Sprogø 3, Kjels Nor 9. 30te Vyl 1 (64 faldt), Horns Rev 3, Lyngvig 1 (101 faldt), Kjels Nor 2.

November: 1ste Sprogø 1, Kjels Nor 7.

(1910.)

58. *Turdus musicus.* Sangdrossel.

Februar: 11te Vyl 1.

Marts: 4de Vyl 1. 16de Kjels Nor 2.

April: 6te Anholt 2. 14de Læsø Trindel 1, Østre Flak 1. 28de Anholt Knob 1.

Maj: 5te Læsø Trindel 8. 6te Østre Flak 1, Anholt Knob 1, Anholt 2 (22 faldt).

September: 10de Vyl 1. 15de Rubjerg Knude 2. 28de Lodbjerg 2.

Oktober: 2den Østre Flak 2. 3dje Lyngvig 1 (4 faldt). 5te Vyl 1, Horns Rev 2, Lyngvig 1. 7de Gjedser Rev 5. 10de Horns Rev 9. 11te Vyl 4, Læsø Trindel 1, Læsø Rende 1, Kjels Nor 25, Gjedser 1, Gjedser Rev 11. 12te Vyl 2, Gjedser Rev 1. 13de Lodbjerg 1, Østre Flak 7, Anholt Knob 2, Gjedser Rev 1. 16de Skagens Rev 1. 24de Vyl 1. 26de Vyl 1. 27de Horns Rev 1, Hyllekrog 1. 28de Vyl 1 (5 faldt). 29de Stevns 1, Kjels Nor 2.

59. *Turdus viscivorus.* Misteldrossel.

Marts: 5te Østre Flak 1. 10de Østre Flak 1.

April: 5te Hanstholm 1.

60. *Turdus pilaris.* Sjagger.

Februar: 5te Vyl 2. 8de Læsø Rende 7, Østre Flak 9, Anholt 4 (12 faldt). 13de Schultz's Grund 6. 18de Omø 1.

April: 19de Vyl 1.

Maj: 5te Skagen 2, Læsø Trindel 2.

Oktober: 26de Vyl 1. 28de Lyngvig 1 (10 faldt), Østre Flak 4. 29de Anholt 1 (19 faldt), Hjelm 1, Sprogø 2, Kjels Nor 1. 30te Vyl 1 (7 faldt), Kjels Nor 2.

November: 1ste Vyl 1, Sprogø 1, Kjels Nor 2. 11te Østre Flak 1.

61. *Turdus torqvatus.* Ringdrossel.

Oktober: 7de Gjedser Rev 1. 11te Lyngvig 1 jun.

62. *Turdus merula.* Solsort.

Marts: 8de Lyngvig 1 ♀, Hanstholm 1 ♂ vet. 9de Læsø Trindel 1 ♂ jun. 10de Lodbjerg 1 ♀, Østre Flak 1 ♀, Anholt

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1 ♂ jun. (4 faldt). 12te Schultz's Grund 1 ♀, Kjels Nor 1 ♂ jun. 15de Vyl 1 ♂ vet., Horns Rev 3 ♀. 17de Vyl 5 ♀, Horns Rev 3 ♀, Lodbjerg 1 ♂ vet. 18de Stevns 2 ♂ vet. 28de Vyl 1 ♂ vet.

April: 2den Østre Flak 1 ♀. 9de Østre Flak 1 ♀.

Maj: 6te Anholt 1 ♂ vet.

Oktober: 25de Vyl 1 ♀. 26de Vyl 2 (♂ vet., ♀), Horns Rev 2 (♂ jun., ♀). 27de Vyl 4 (2 ♂ vet., 2 ♀). 29de Anholt 1 ♂ vet. 30te Vyl 3 (1 ♂ vet., 1 ♂ jun., 1 ♀), Lyngvig 1 ♂ vet. (7 faldt).

November: 1ste Kjels Nor 1 ♀. 12te Horns Rev 1 ♂ vet. 13de Vyl 1 ♂ vet.

63. *Saxicola oenanthe.* Stenpikker.

April: 14de Anholt Knob 1 ♂. 15de Lyngvig 1 ♂. 30te Østre Flak 1 ♀.

Maj: 6te Østre Flak 2 ♀. 20de Vyl 1 ♀.

August: 30te Kjels Nor 2.

September: 5te Sprogø 1. 6te Læsø Trindel 1, Kjels Nor 2. 7de Stevns 3. 8de Læsø Trindel 2, Gjedser Rev 1. 10de Vyl 3, Læsø Trindel 2. 11te Hanstholm 1. 12te Lyngvig 1. 14de Vyl 9, Lyngvig 1, Østre Flak 1. 15de Horns Rev 4, Lyngvig 1, Rubjerg Knude 1, Østre Flak 1.

64. *Praticola rubetra.* Bynkefugl.

Maj: 6te Anholt 1 ♂. 18de Vyl 1 ♂.

September: 7de Stevns 2.

Oktober: 3dje Lyngvig 1.

65. *Ruticilla phoenicura.* Rødstjert.

Maj: 5te Læsø Trindel 1 ♂. 6te Anholt 4 ♂. 18de Vyl 1 ♂.

August: 30te Anholt Knob 1 ♂, Hyllekrog 1 ♂.

September: 5te Anholt Knob 2 (♂, ♀), Anholt 11 (4 ♂, 7 ♀), Sprogø 2 ♀. 6te Kjels Nor 8 (4 ♂, 4 ♀). 7de Stevns 15 (9 ♂, 6 ♀). 8de Vyl 1 ♀, Læsø Trindel 1 ♂, Gjedser Rev 1 ♀. 10de Lyngvig 1 ♀, Læsø Trindel 1 ♀. 11te Hanstholm 13 (2 ♂, 11 ♀), Rubjerg Knude 1 ♀ (5 faldt), Skagen 1 ♀. 12te Anholt Knob 1 ♂, Drogden 1 ♂. 13de Lodbjerg 1 ♀. 14de Kjels Nor 8

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(3 ♂, 5 ♀). 15de Horns Rev 7 (3 ♂, 4 ♀), Lyngvig 1 ♂, Lodbjerg 1 ♀.

66. ***Erithacus rubecula.*** Rødkjælk.

Marts: 12te Kjels Nor 1. 17de Drogden 1.

April: 14de Østre Flak 1, Anholt Knob 1 (3 faldt). 15de Sprogø 1. 17de Østre Flak 1.

Maj: 6te Anholt 2.

September: 7de Stevns 1. 8de Gjedser Rev 2. 11te Lyngvig 1, Hanstholm 1, Skagen 1. 12te Lappegrund 1, Drogden 1. 14de Kjels Nor 1. 15de Østre Flak 1.

Oktober: 2den Østre Flak 4 (14 faldt). 5te Horns Rev 1. 6te Stevns 1, Hyllekrog 2. 7de Gjedser Rev 2. 11te Sejrø 1, Kjels Nor 9, Gjedser 1, Gjedser Rev 5. 12te Gjedser Rev 1. 13de Østre Flak 1. 29de Horns Rev 4, Lyngvig 1, Anholt 1, Stevns 5, Gjedser Rev 1. 30te Vyl 1, Horns Rev 1, Lyngvig 1. 31te Hov 1.

67. ***Cyanecula suecica.*** Blaakjælk.

September: 15de Horns Rev 1.

68. ***Muscicapa atricapilla.*** Broget Fluesnapper.

Maj: 5te Læsø Trindel 1 ♀. 6te Anholt 1 ♂.

August: 30te Lodbjerg 1, Kjels Nor 1, Hyllekrog 8.

September: 1ste Hanstholm 8. 6te Drogden 1, Kjels Nor 22. 7de Stevns 5. 8de Læsø Trindel 1. 10de Lyngvig 1. 11te Hanstholm 4, Skagen 1. 12te Lyngvig 1, Drogden 2. 15de Horns Rev 1.

Oktober: 11te Sejrø 1.

69. ***Muscicapa grisola.*** Graa Fluesnapper.

September: 7de Stevns 1 jun.

70. ***Fringilla coelebs.*** Bogfinke.

Marts: 12te Østre Flak 1 ♂.

Oktober: 5te Vyl 1 ♀. 12te Vyl 1 ♂. 30te Vyl 1 ♂.

71. ***Fringilla montifringilla.*** Kvæker.

Januar: 7de Østre Flak 1 ♂. 10de Læsø Rende 1 ♂. 12te Lyngvig 1 ♂, Kjels Nor 9 (6 ♂, 3 ♀), Gjedser 3 ♀, Gjedser

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Rev 3 (2 ♂, 1 ♀). 26de Vyl 2 (♂, ♀). 28de Østre Flak 1 ♂. 29de Lodbjerg 1 ♀, Anholt 1 ♀.

72. *Chrysomitris spinus.* Sisken.

Oktober: 5te Vyl 1 ♂, Horns Rev 1 ♂.

73. *Cannabina linaria.* Graasisken.

Oktober: 22de Læsø Trindel 1 ♂. 23de Østre Flak 2, Hammeren 1. 25de Vyl 1 ♂. 26de Vyl 3, Horns Rev 1 ♂, Lyngvig 1 ♂. 27de Vyl 2 ♂. 28de Lodbjerg 1 ♂. 29de Skagen 3 (1 ♂ ad., 1 ♂ jun., 1 ♀), Stevns 2, Gjedser Rev 1. 30te Vyl 1 ♂, Horns Rev 1 ♀. De indsendte Graasiskener viste paafaldende Forskjelligheder i Næbstørrelse o. a.

74. *Emberiza schoeniclus.* Rørspurv.

Oktober: 2den Østre Flak 4. 6te Horns Rev 2. 11te Anholt Knob 1, Gjedser Rev 3. 27de Horns Rev 1 ♂.

75. *Emberiza hortulana.* Hortulan.

Maj: 6te Anholt 2.

August: 30te Vyl 1.

76. *Emberiza citrinella.* Gulspurv.

November: 1ste Kjels Nor 1.

December: 14de Læsø Rende 1.

77. *Emberiza nivalis.* Snespurv.

Februar: 12te Læsø Rende 1 ♂.

Oktober: 29de Horns Rev 1 ♀, Anholt 1 ♀, Stevns 1 ♂. 30te Vyl 1 ♀, Lyngvig 1 ♀.

November: 9de Østre Flak 2 (♂, ♀). 28de Læsø Trindel 1 ♂.

Oversigt over de Nætter da Fugle ere komne til Fyrene.

(Hver Nat dateret som den følgende Dag.)

3dje Januar.

Læsø Rende. Vestlig Bramsejlskuling, Taage; enkelte Fugle ved Fyret; en Lærke faldt.

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Alauda arvensis 1*).

4de Januar.

Skagen. V., trerebet Merssejlskuling, overtrukket; en Stær ved Ruderne.

6te Januar.

Lodbjerg. N. N. V., laber Kuling, Taage og Dis; enkelte Lærker ved Ruderne før Midnat; 2 faldt. *Sprogø.* En Lærke ved Ruderne. *Æbelø.* V. S. V., laber Bramsejlskuling, Tykning og Taage; en Del Smaafugle paa Ruderne; en Lærke faldt.

Alauda arvensis. Lodbjerg 2. Æbelø 1.

7de Januar.

Østre Flak. V. S. V., laber Bramsejlskuling, overtrukket; en Kvæker faldt.

Fringilla montifringilla 1.

9de Januar.

Læsø Rende. S. V., Merssejlskuling, overtrukket; en Lærke faldt.

Alauda arvensis 1.

10de Januar.

Læsø Rende. S. V., Merssejlskuling, Regnbyger; en Kvæker faldt.

Fringilla montifringilla 1.

12te Januar.

Østre Flak. V., laber Bramsejlskuling, skyet; en Kvæker faldt.

Fringilla montifringilla 1.

16de Januar.

Lyngvig. S. V., Bramsejlskuling, Regntykning; en Lærke faldt.

Alauda arvensis 1.

30te Januar.

Lodbjerg. N., Bramsejlskuling, Sne og Taage; en Blishøne fløj mod Ruderne efter Midnat og faldt. *Æbelø.* S. V., Bramsejlskuling, diset, Snebyger; nogle Smaafugle paa Ruderne; en Vandrixe faldt.

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*) Med systematisk Navn opføres de Fugle, der ere indsendte til Museet. Naar kun Prøver ere sendte, er Tallet paa de faldne vedføjet efter Fyrmestrenes Oplysninger (se Anm. S. 125).

Rallus aqvaticus. Æbelø 1.

Fulica atra. Lodbjerg 1.

1ste Februar.

Romsø. Mange Stære ved Ruderne om Natten.

3dje Februar.

Gjedser Rev. S. S. Ø., Bramsejlskuling, Snetykning; 4 store Drosler ved Fyret, ingen faldne.

4de Februar.

Æbelø. S. Ø., laber Kuling, diset; nogle Lærker og Stære paa Ruderne.

5te Februar.

Vyl. V.S.V., Bramsejlskuling, graat; 2 Sjaggere faldt. *Hanstholm.* S. V., laber Kuling, graat, diset; en Del Sjaggere om Fyret fra Kl. 9 til 1. *Sprogø.* V., laber Kuling, Dis og Taage; 3 Lærker faldt. *Kjels Nor.* S. S. V., laber Bramsejlskuling, diset; flere forskjellige Fugle hørtes om Natten, blandt dem Viben; en Vindrossel faldt. *Hyllekrog.* Stille, Taage; enkelte Smaafugle paa Ruderne, blandt dem en Lærke; en Kvæker faldt.

Alauda arvensis. Sprogø 1; 3 faldt.

Turdus iliacus. Kjels Nor 1.

Turdus pilaris. Vyl 2.

Fringilla montifringilla. Hyllekrog 1.

6te Februar.

Horns Rev. V. S. V., graat; omtrent 50 Smaafugle ved Fyret.

7de Februar.

Hanstholm. Stille, Sne; en Del Sjaggere om Fyret fra Kl. 9 til 12.

8de Februar.

Læsø Rende. N. Ø., laber Kuling, Sne; 7 Sjaggere faldt. *Østre Flak.* N. Ø., laber Bramsejlskuling, Sne; mange Smaafugle ved Fyret hele Natten; mange faldt i Vandet, 10 Drosler paa Dækket. *Anholt Knob.* N. N. Ø., Bramsejlskuling, Snetykning; en Del Drosler ved Fyret; en Vindrossel faldt. *Anholt.* N. Ø., rebet Merssejlskuling, Snetykning; en stor Flok Sjaggere ved Ruderne;

12 faldt. *Hjelm.* N. Ø., Merssejlskuling, Taage og Sne; mange Sjaggere, Solsorter og Lærker ved Fyret; ingen faldt. *Sejrø.* Fra Ø. S. Ø. til S. V. paa Fornatten, senere N. N. Ø. tiltagende Kuling, Regntykning; meget stort Træk af Smaafugle om Fyret; 5 Drosler faldt (ikke indsendte). *Sprogø.* V., Bramsejlskuling, Taage; 2 Lærker faldt.

Alauda arvensis. Sprogø 2.

Turdus iliacus. Østre Flak 1. Anholt Knob 1.

Turdus pilaris. Læsø Rende 7. Østre Flak 9. Anholt 4; 12 faldt.

9de Februar.

Sprogø. Lærker og andre paa Ruderne.

10de Februar.

Sprogø. Lærker paa Ruderne. *Omø.* V. til S., laber Bramsejlskuling, overtrukket; 2 Lærker ved Fyret.

11te Februar.

Vyl. S. S. V., Merssejlskuling, Regn; en Del Fugle om Fyret; en Lærke og en Sangdrossel faldt.

Alauda arvensis 1.

Turdus musicus 1.

12te Februar.

Vyl. S. S. V., Bramsejlskuling, Regn; Lærker og Stære om Fyret. *Horns Rev.* S., overtrukket, Regn; omtrent 50 Lærker og Stære ved Fyret; 10 Lærker, 1 Stær faldt. *Læsø Rende.* S. S. V., laber Kuling, Taage; en Snespurv faldt. *Ærø.* Stille, diset, overtrukket; nogle Lærker og Stære paa Ruderne. *Gjedser Rev.* S., Bramsejlskuling, Snetykning; 2 store Drosler faldt i Vandet.

Alauda arvensis. Horns Rev 10.

Sturnus vulgaris. Horns Rev 1.

Emberiza nivalis. Læsø Rende 1.

13de Februar.

Læsø Trindel. S. S. V., Bramsejlskuling, Taage; enkelte Smaafugle ved Fyret; en Lærke faldt. *Schultz's Grund.* S. V., Bram-

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sejlskuling, taaget; 7 Drosler faldt. *Hyllekrog.* Stille, Taage; en enkelt Stær paa Ruderne, den første iaar.

Alauda arvensis. Læsø Trindel 1.

Turdus iliacus. Schultz's Grund 1.

Turdus pilaris. Schultz's Grund 6.

14de Februar.

Lyngvig. S., rebet Merssejlskuling, overtrukket; en Vibe og en Lærke faldt. *Sejrø.* S. S. Ø., enrebet Merssejlskuling, diset, skyet, 8 Lærker ved Ruderne. *Sprogø.* S., Merssejlskuling, overtrukket; en Lærke faldt. *Omø.* S., Bramsejlskuling, overtrukket, diset; 2 Lærker faldt; en Stær ved Ruderne. *Kjels Nor.* S. Ø., Bramsejlskuling, overtrukket, diset; 7 Lærker faldt.

Vanellus cristatus. Lyngvig 1.

Alauda arvensis. Lyngvig 1. (Sprogø 1.) Omø 2. Kjels Nor 7.

15de Februar.

Gjedser Rev. S. S. Ø., Merssejlskuling, overtrukket; 7 Fugle ved Fyret; 5 Lærker faldt.

Alauda arvensis 4; 5 faldt.

16de Februar.

Vyl. V. S. V., Bramsejlskuling, graat; en Lærke faldt. *Lodbjerg.* S. S. V., Bramsejlskuling, Sne, Regn og Taage; nogle Stære ved Ruderne efter Midnat. *Sprogø.* S., Bramsejlskuling, diset; 2 Lærker faldt og bleve spiste af Katten.

Alauda arvensis. Vyl 1. (Sprogø 2.)

17de Februar.

Østre Flak. S. V., laber Bramsejlskuling, overtrukket; 3 Lærker faldt. *Anholt Knob.* Sydlig laber Bramsejlskuling, overtrukket; enkelte Stære ved Fyret; 1 faldt.

Alauda arvensis. Østre Flak 3.

Sturnus vulgaris. Anholt Knob 1.

18de Februar.

Hjelm. S. V., Bramsejlskuling, Dis; flere Stære ved Ruderne. *Omø.* S. V. til V., trerebet Merssejlskuling, skyet, diset; en Sjagger faldt.

Turdus pilaris. Omø 1.

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19de Februar.

Hanstholm. S. S. V., Bramsejlskuling, Taage; 2 Viber om Fyret Kl. 6 Fm. *Østre Flak.* S. S. V., laber Bramsejlskuling, Taage; mange Smaafugle ved Fyret ved Morgen; 6 faldt. *Sprogø.* S. V., laber Bramsejlskuling, diset; en Stær med knækket Vinge ved Fyret. *Kjels Nor.* S. S. V., Bramsejlskuling, overtrukket, Dis, Regn; en Vibe og en Stær faldt. *Gjedser Rev.* S. V., laber Kuling, Regn og diset; nogle faa Stære ved Fyret.

Vanellus cristatus. Kjels Nor 1.

Alauda arvensis. Østre Flak 5.

Sturnus vulgaris. Østre Flak 1. Kjels Nor 1.

20de Februar.

Hanstholm. S. S. Ø., Bramsejlskuling, Regndis; en Lærke faldt. *Anholt Knob.* Ø. S. Ø., enrebet Merssejlskuling, overtrukket, Regn; en Lærke opholdt sig paa Skibet og fandtes senere død.

Alauda arvensis. (Hanstholm 1.) Anholt Knob 1.

24de Februar.

Anholt Knob. Stille, diset; nogle Lærker ved Fyret; 1 faldt.

Alauda arvensis 1.

27de Februar.

Vyl. N. Ø., Merssejlskuling, Regn; om Natten satte Raager sig i stort Tal i Timeglasset og Rigningen, skjønt Vejret var sigtbart; det var første Gang i Aaret, at Raager viste sig; 1 faldt; om Eftermiddagen fløj de andre Ø.; Viber bleve sete. *Horns Rev.* Ø. N. Ø., overtrukket, Regn; 15 Raager opholdt sig i Rigningen om Natten; ved Daggry fløj de Ø.

Corvus frugilegus. Vyl 1.

28de Februar.

Læsø Trindel. Ø. N. Ø., Bramsejlskuling, Regnbyger; enkelte Smaafugle ved Fyret. *Østre Flak.* Ø., laber Kuling, overtrukket; mange Lærker ved Fyret hele Natten; 4 faldt.

Alauda arvensis. Østre Flak 4.

1ste Marts.

Østre Flak. S. S. Ø., Bramsejlskuling, overtrukket; en Lærke faldt.

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Alauda arvensis 1.

2den Marts.

Lodbjerg. S., laber Bramsejlskuling, overtrukket, Taage; en Stær ved Ruderne efter Midnat.

3dje Marts.

Anholt Knob. S. S. Ø., laber Bramsejlskuling, Taage; enkelte Lærker ved Fyret; 2 faldt. *Schultz's Grund.* S. S. Ø., Bramsejlskuling, Taage; 4 Lærker faldt. *Sprogø.* En Solsort ved Ruderne.

Alauda arvensis. Anholt Knob 2. Schultz's Grund 4.

4de Marts.

Vyl. S. S. Ø., Bramsejlskuling, Taage; en Del Lærker og Drosler ved Fyret; en Sangdrossel faldt. *Horns Rev.* S. Ø., Taage; enkelte Lærker ved Fyret. *Læsø Trindel.* Sydlig laber Bramsejlskuling, overtrukket; en Del Smaafugle ved Fyret; 2 Lærker faldt. *Læsø Rende.* S. S. Ø., laber Kuling, overtrukket; en Stær faldt. *Sejrø.* Ø. S. Ø., Bramsejlskuling, overtrukket, diset; Træk af Drosler og Lærker; 2 Drosler faldt (ikke indsendte). *Hyllekrog.* Ø. S. Ø., Taage; en Del Fugle paa Ruderne; en Skovdue faldt (ikke indsendt).

Alauda arvensis. Læsø Trindel 2.

(*Sturnus vulgaris.* Læsø Rende 1.)

Turdus musicus. Vyl 1.

5te Marts.

Østre Flak. S. Ø., laber Bramsejlskuling, overtrukket; en Lærke og en Misteldrossel faldt.

Alauda arvensis 1.

Turdus viscivorus 1.

7de Marts.

Lyngvig. S. S. Ø., laber Kuling, skyet; en Lærke faldt.

Alauda arvensis 1.

8de Marts.

Vyl. S. S. Ø., laber Bramsejlskuling, graat; en Del Fugle ved Fyret; 3 faldt. *Horns Rev.* S., skyet; en Mængde forskjellige

Fugle ved Fyret; flere faldt i Vandet, en Stær paa Dækket. *Lyngvig.* S. S. Ø., laber Kuling, diset; mange Viber og Stære om Fyret; 3 Fugle faldt. *Bovbjerg.* S. S. Ø., Bramsejlskuling, diset; Stære i Mængde om Fyret, enkelte Viber. *Lodbjerg.* S. Ø., laber Bramsejlskuling, overtrukket, Regn og Dis; mange Stære og Viber ved Ruderne efter Midnat; 5 Fugle faldt. *Hanstholm.* S. Ø., laber Bramsejlskuling, Regndis; en stor Flok Stære ved Ruderne; Viber, Hjejler og nogle Solsorter flagrede om Fyret fra Kl. 3 til Dag; 4 Fugle faldt. *Hjelm.* S., Bramsejlskuling, Taage; 4 Stære ved Ruderne. *Vestborg.* Sydlig Vind, Taage; 2 Lærker, en Solsort faldt (ikke indsendte). *Hammeren.* S. S. Ø., laber Bramsejlskuling, overtrukket; en Stær ved Ruderne; en Lærke faldt. *Gjedser Rev.* S. Ø., laber Kuling, Taage; Drosler ved Fyret; Viben hørtes.

Vanellus cristatus. Lyngvig 1. Lodbjerg 1. Hanstholm 2.

Ægialitis hiaticula. Hanstholm 1.

Tringa alpina. Lodbjerg 2.

Corvus monedula. Vyl 1.

(*Alauda arvensis.* Vestborg 2. Hammeren 1.)

Sturnus vulgaris. Vyl 1. Horns Rev 1. Lyngvig 1. Lodbjerg 2.

Turdus iliacus. Vyl 1.

Turdus merula. Lyngvig 1. Hanstholm 1.

9de Marts.

Læsø Trindel. S., Merssejlskuling, skyet; en Del Smaafugle ved Fyret; 2 faldt. *Anholt Knob.* S. S. Ø., Bramsejlskuling, overtrukket, diset; enkelte Smaafugle ved Fyret.

Alauda arvensis. Læsø Trindel 1.

Turdus merula. Læsø Trindel 1.

10de Marts.

Lyngvig. S., rebet Merssejlskuling, Regn; Stære og Drosler om Fyret; 2 Fugle faldt. *Lodbjerg.* S. S. Ø., enrebet Merssejlskuling, overtrukket, Regn og Dis; enkelte Lærker, Stære og Drosler ved Ruderne efter Midnat; 2 Fugle faldt. *Hanstholm.* S. Ø., laber Bramsejlskuling, Regndis og Taage; en Del Stære og Viber

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flagrede om Fyret fra Kl. 10 til 4. ***Rubjerg Knude.*** S. S. Ø., Merssejlskuling, Regn; en Del Smaafugle ved Ruderne. ***Læsø Rende.*** Sydlig Bramsejlskuling, skyet; en Del forskjellige Fugle om Fyret; en Lærke faldt. ***Østre Flak.*** S., laber Bramsejlskuling, overtrukket; mange Smaafugle ved Fyret; 9 faldt paa Dækket, flere i Vandet. ***Anholt Knob.*** S. S. Ø., Merssejlskuling, overtrukket, diset; 2 Fugle faldt. ***Anholt.*** S. S. Ø., rebet Merssejlskuling, diset; 31 Fugle faldt.

Tringa alpina. Lyngvig 1.

Columba palumbus. Anholt Knob 1.

Alauda arborea. Anholt 1.

Alauda arvensis. Lodbjerg 1. Læsø Rende 1. Østre Flak 6. Anholt Knob 1. Anholt 4; 14 faldt.

Sturnus vulgaris. Anholt 2; 12 faldt.

Turdus iliacus. Lyngvig 1. Østre Flak 1.

Turdus viscivorus. Østre Flak 1.

Turdus merula. Lodbjerg 1. Østre Flak 1. Anholt 1; 4 faldt.

11te Marts.

Lodbjerg. S. S. V., Merssejlskuling, overtrukket, Taage; nogle Stære ved Ruderne efter Midnat. ***Skagen.*** S. V., Bramsejlskuling, overtrukket; en Del Stære ved Ruderne. ***Læsø Trindel.*** S. V., Bramsejlskuling, overtrukket; en Del Smaafugle ved Fyret; nogle faldt i Vandet. ***Vestborg.*** Sydlig Vind, Taage; 2 Lærker faldt. ***Gjedser Rev.*** S. Ø., laber Kuling, diset; enkelte Smaafugle om Fyret.

(*Alauda arvensis.* Vestborg 2.)

12te Marts.

Vyl. V., laber Bramsejlskuling, skyet; en Lærke faldt. ***Skagen.*** V., laber Bramsejlskuling, Taage; 6 Lærker faldt. ***Læsø Rende.*** S. S. V., laber Kuling, Taage; mange Lærker om Fyret; 3 Fugle faldt. ***Østre Flak.*** S. V., laber Kuling, overtrukket; en Del Smaafugle ved Fyret; 2 faldt. ***Anholt Knob.*** Vestlig laber Kuling, overtrukket; enkelte Smaafugle ved Fyret; en Lærke faldt. ***Schultz's Grund.*** V. S. V., laber Kuling, Taage; en Solsort faldt. ***Kjels***

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Nor. Vindstille, Taage, Regn; 4 Fugle faldt. *Hammeren.* V., laber Bramsejlskuling, Taage; en Stær ved Ruderne. *Gjedser Rev.* Stille, Taage; enkelte Lærker ved Fyret.

Pagonetta glacialis. Kjels Nor 1.

Alauda arvensis. Vyl 1. Skagen 5; 6 faldt. Læsø Rende 2. Østre Flak 1. Anholt Knob 1. Kjels Nor 1.

Turdus iliacus. Læsø Rende 1.

Turdus merula. Schultz's Grund 1. Kjels Nor 1.

Erithacus rubecula. Kjels Nor 1.

Fringilla coelebs. Østre Flak 1.

14de Marts.

Læsø Trindel. S. V., Merssejlskuling, Regn; enkelte Smaafugle ved Fyret; 2 Lærker faldt. *Schultz's Grund.* V. S. V., laber Bramsejlskuling, skyet; en Stær faldt.

Alauda arvensis. Læsø Trindel 2.

Sturnus vulgaris. Schultz's Grund 1.

15de Marts.

Blaavands Huk. S. V., laber Bramsejlskuling, diset; en Flok Stære ved Fyret; 3 faldt. *Vyl.* V. S. V., Bramsejlskuling, skyet, en Del Smaafugle om Fyret; 3 faldt. *Horns Rev.* V. S. V., graat; omtrent 30 forskjellige Smaafugle ved Fyret; 4 faldt. *Lodbjerg.* V. S. V., Bramsejlskuling, overtrukket, Dis; enkelte Stære ved Ruderne hele Natten. *Læsø Trindel.* V., Bramsejlskuling, klart; en Stær faldt. *Omø.* S. V. til V., Bramsejlskuling, skyet, diset; en Del Lærker og Stære om Fyret; 2 Fugle faldt.

Alauda arvensis. Omø 1.

Sturnus vulgaris. (Blaavands Huk 3.) Vyl 2. Horns Rev 1. Læsø Trindel 1. (Omø 1.)

Turdus merula. Vyl 1. Horns Rev 3.

16de Marts.

Læsø Trindel. S. V., Merssejlskuling, Regn; en Lærke faldt. *Sejrø.* V. N. V., Bramsejlskuling, skyet, diset; 5 Stære paa Ruderne. *Sprogø.* N. V., Bramsejlskuling, overtrukket; en Drossel faldt (ikke indsendt). *Omø.* S. V. til V., laber Bramsejlskuling, skyet, diset;

2 Gravænder faldt. *Kjels Nor.* V., laber Bramsejlskuling, overtrukket, diset; 7 Fugle faldt. *Hammeren.* V., laber Bramsejlskuling, diset; 2 Stære paa Ruderne. *Gjedser Rev.* S. V., laber Bramsejlskuling, overtrukket; omtrent 50 Lærker, Stære, Drosler, Viber og 2 Skovduer ved Fyret; en Skovdue faldt i Vandet. *Hyllekrog.* Stille, diset; en Del Fugle, mest Stære, ved Ruderne.

Tadorna cornuta. Omø 2.

Vanellus cristatus. Kjels Nor 2.

Alauda arvensis. Læsø Trindel 1. Kjels Nor 1.

Sturnus vulgaris. Kjels Nor 1.

Turdus iliacus. Kjels Nor 1.

Turdus musicus. Kjels Nor 2.

17de Marts.

Blaavands Huk. V. S. V., laber Bramsejlskuling, diset; 4 Stære faldt. *Vyl.* V. S. V., rebet Merssejlskuling, graat; mange Fugle om Fyret; 10 faldt. *Horns Rev.* V. S. V., Regn; omtrent 25 forskjellige Smaafugle ved Fyret; 6 faldt. *Lodbjerg.* V. S. V., trerebet Merssejlskuling, overtrukket, Regntykning; enkelte Stære og Drosler ved Ruderne; 3 Fugle faldt. *Drogden.* V., stiv Kuling, diset; en Del Fugle ved Fyret; 2 faldt paa Dækket, flere overbord.

Sturnus vulgaris. (Blaavands Huk 4.) Vyl 3. Horns Rev 3. Lodbjerg 1. Drogden 1.

Turdus iliacus. Vyl 2. Lodbjerg 1.

Turdus merula. Vyl 5. Horns Rev 3. Lodbjerg 1.

Erithacus rubecula. Drogden 1.

18de Marts.

Stevns. V. N. V., Bramsejlskuling, overtrukket, diset; 4 Fugle faldt.

Sturnus vulgaris 2.

Turdus merula 2.

19de Marts.

Lyngvig. N. V. Bramsejlskuling, skyet; en Stokand faldt.

Anas boscas 1.

20de Marts.

Blaavands Huk. S., Taage; en Stær faldt. *Lyngvig.* N. N. V., Bramsejlskuling, skyet; en Præstekrave faldt. *Hov.* Stille, klart; en Stær faldt.

Ægialitis hiaticula. Lyngvig 1.

Sturnus vulgaris. (Blaavands Huk 1.) Hov 1.

21de Marts.

Lodbjerg. V. S. V., Merssejlskuling, overtrukket, Dis; 2 Stære ved Ruderne efter Midnat. *Skagen.* V., Merssejlskuling, Taage; en Del Stære ved Ruderne. *Østre Flak.* V. S. V., laber Bramsejlskuling, diset; en stor Flok Stære kredsede om Skibet ved Morgen.

27de Marts.

Horns Rev. Stille, Taage; omtrent 50 Stære og 6 Viber kredsede nogle Gange om Fyret ved Daggry, hvorefter de fløj S. Ø. *Vestborg.* Nordlig Vind, Taage; en Lærke og 2 Drosler faldt (ikke indsendte).

(*Alauda arvensis.* Vestborg 1.)

28de Marts.

Vyl. V. N. V., Bramsejlskuling, skyet; en Del Fugle ved Fyret; en Solsort faldt.

Turdus merula 1.

2den April.

Østre Flak. S. Ø., laber Bramsejlskuling, skyet; 2 Fugle faldt.

Sturnus vulgaris 1.

Turdus merula 1.

3dje April.

Læsø Trindel. S. S. Ø., Bramsejlskuling, skyet; enkelte Smaafugle ved Fyret.

4de April.

Hammeren. S. Ø., Merssejlskuling, overtrukket; 2 Stære ved Ruderne.

5te April.

Vyl. N. Ø., laber Bramsejlskuling, skyet; Kl. 9 Aften, den 4de, kom en Vibe flyvende mod Skibssiden og faldt i Vandet; den

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blev liggende lidt, men fløj derefter Ø. *Hanstholm.* Ø., laber Bramsejlskuling, graat; enkelte Fugle om Fyret; en Misteldrossel faldt. *Læsø Trindel.* Ø. S. Ø., laber Bramsejlskuling, overtrukket; enkelte Smaafugle ved Fyret. *Læsø Rende.* S. Ø., Bramsejlskuling, overtrukket; en Drossel faldt (ikke indsendt). *Stevns.* Ø. S. Ø., stiv Kuling, diset; en Gjerdesmutte faldt. *Hammeren.* N. Ø., rebet Merssejlskuling, Taage og Regn; en Drossel funden død (ikke indsendt).

Troglodytes parvulus. Stevns 1.

Turdus viscivorus. Hanstholm 1.

6te April.

Læsø Trindel. Ø. N. Ø., Bramsejlskuling, skyet; enkelte Smaafugle ved Fyret. *Anholt.* N. Ø., torebet Merssejlskuling, overtrukket; en stor Flok Fugle, mest Stære, om Fyret; 25 faldt. *Sejrø.* N. N. Ø., torebet Merssejlskuling, overtrukket, Regn; stort Træk; omtrent 30 Stære ved Ruderne; 9 Stære og 3 Drosler faldt (ikke indsendte). *Stevns.* N. N. Ø., Bramsejlskuling, overtrukket, Regntykning; 14 Fugle faldt. *Hyllekrog.* Nordlig flov Kuling, overtrukket; mange Fugle ved Ruderne; en Stær faldt.

Rallus aqvaticus. Stevns 1.

Vanellus cristatus. Stevns 1.

Alauda arvensis. Anholt 1.

Sturnus vulgaris. Østre Flak 2. Anholt 13; 22 faldt. (Sejrø 9.) Stevns 12. Hyllekrog 1.

Turdus musicus. Anholt 2.

9de April.

Østre Flak. V., Bramsejlskuling, skyet; 5 Fugle faldt.

Alauda arvensis 1.

Sturnus vulgaris 3.

Turdus merula 1.

13de April.

Fornæs. S. S. V., laber Kuling, Regn; flere Spover kredsede om Fyret.

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14de April.

Vyl. S., laber Bramsejlskuling, overtrukket, Regn; mellem Kl. 8 og 10 Aften, den 13de, hørtes en Del Spover flyvende Ø.; en Ugle opholdt sig i Rigningen største Delen af Natten. *Læsø Trindel.* S., Bramsejlskuling, Regn, skyet; enkelte Smaafugle ved Fyret; en Sangdrossel faldt. *Østre Flak.* S., laber Bramsejlskuling, overtrukket, Regn; flere Fugle ved Fyret; 3 faldt. *Anholt Knob.* Sydlig laber Bramsejlskuling, overtrukket, Regn; 4 Fugle faldt. *Vestborg.* S. S. Ø., Taage og Dis; 2 Drosler faldt (ikke indsendte). *Omø.* S., laber Bramsejlskuling, Regn og Taage; flere Smaafugle ved Fyret; en Skovsneppe faldt.

Scolopax rusticula. Omø 1.

Regulus cristatus. Østre Flak 1.

Turdus musicus. Læsø Trindel 1. Østre Flak 1.

Saxicola oenanthe. Anholt Knob 1.

Erithacus rubecula. Østre Flak 1. Anholt Knob 1; 3 faldt.

15de April.

Vyl. S., laber Kuling, Dis; en Løvsanger opholdt sig iaftes paa Dækket og fandtes om Morgenen død. *Lyngvig.* S. Ø., Bramsejlskuling, overtrukket; en Stenpikker faldt. *Lodbjerg.* Ø. S. Ø., laber Bramsejlskuling, overtrukket, Dis; 3 forskjellige Smaafugle ved Ruderne efter Midnat. *Sprogø.* 2 Fugle fandtes døde, maaske ikke faldne denne Nat.

Tringa alpina. Sprogø 1.

Phyllopseustes trochilus. Vyl 1.

Saxicola oenanthe. Lyngvig 1.

Erithacus rubecula. Sprogø 1.

16de April.

Vyl. Stille, Taage; en Fuglekonge opholdt sig paa Dækket om Formiddagen og fandtes senere død.

Regulus cristatus 1.

17de April.

Læsø Trindel. S. V., laber Bramsejlskuling, overtrukket, Taage; en Del Smaafugle ved Fyret. *Østre Flak.* Stille, over-

trukket; 2 Fugle faldt; flere forskjellige Smaafugle opholdt sig ved Skibet om Morgenen.

Anthus pratensis. Østre Flak 1.

Erithacus rubecula. Østre Flak 1.

19de April.

Vyl. V., Merssejlskuling, Regn; enkelte Fugle ved Fyret; en Sjagger faldt. *Gjedser Rev.* S. V., Merssejlskuling, Regn; enkelte Stære ved Fyret; 1 faldt.

(*Sturnus vulgaris*. Gjedser Rev 1.)

Turdus pilaris. Vyl 1.

23de April?

Stevns. En Ryle funden død, maaske ikke fra denne Nat.

Tringa alpina 1.

26de April.

Gjedser Rev. S. V., Bramsejlskuling, Regn; nogle faa Lærker og Stære ved Fyret.

28de April.

Anholt Knob. Sydlig enrebet Merssejlskuling, overtrukket; enkelte Smaafugle ved Fyret; en Sangdrossel faldt.

Turdus musicus 1.

29de April.

Lodbjerg. S. V., enrebet Merssejlskuling, overtrukket, Dis; en Stær ved Ruderne efter Midnat. *Østre Flak.* S. S. Ø., laber Bramsejlskuling, overtrukket; 2 Fugle faldt.

Sturnus vulgaris. Østre Flak 1.

Fringilla montifringilla. Østre Flak 1.

30te April.

Østre Flak. S. V., Bramsejlskuling, skyet; 2 Fugle faldt.

Iynx torqvilla 1.

Saxicola oenanthe 1.

5te Maj.

Lodbjerg. S. S. V., laber Kuling, overtrukket, Dis; 3 Smaafugle ved Ruderne efter Midnat. *Skagen.* S. V. og sydlig Merssejlskuling, Regn; 2 Sjaggere faldt. *Læsø Trindel.* S. S. Ø.,

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Bramsejlskuling, Regn; 13 Fugle faldt paa Dækket, mange i Vandet.

Phyllopseustes trochilus. Læsø Trindel 1.

Turdus musicus. Læsø Trindel 8.

Turdus pilaris. Skagen 2. Læsø Trindel 2.

Ruticilla phoenicura. Læsø Trindel 1.

Muscicapa atricapilla. Læsø Trindel 1.

6te Maj.

Skagen. S. V., trerebet Merssejlskuling, Regndis; 2 Fugle faldt. *Østre Flak.* S. S. V., Bramsejlskuling, overtrukket; 3 Fugle faldt. *Anholt Knob.* S. V., Bramsejlskuling, overtrukket, Regn; en Sangdrossel faldt. *Anholt.* Sydlig Merssejlskuling, overtrukket; mange Fugle ved Ruderne, mest Drosler; 42 Fugle faldt.

Gallinago scolopacina. Skagen 1.

Iynx torqvilla. Skagen 1. Anholt 1.

Phyllopseustes trochilus. Anholt 3.

Phyllopseustes rufus. Anholt 2.

Anthus arboreus. Anholt 1.

Turdus musicus. Østre Flak 1. Anholt Knob 1. Anholt 2; 22 faldt.

Turdus merula. Anholt 1.

Saxicola oenanthe. Østre Flak 2.

Praticola rubetra. Anholt 1.

Ruticilla phoenicura. Anholt 4.

Erithacus rubecula. Anholt 2.

Muscicapa atricapilla. Anholt 1.

Fringilla montifringilla. Anholt 2.

Emberiza hortulana. Anholt 2.

11te Maj.

Gjedser Rev. Ø., Bramsejlskuling, overtrukket; omtrent 25 store Drosler og andre ved Fyret; nogle faldt i Vandet.

17de Maj.

Vyl. Ø., Bramsejlskuling, skyet; en Løvsanger faldt.

Phyllopseustes trochilus 1.

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18de Maj.

Vyl. Ø. S. Ø., Bramsejlskuling, skyet; 2 Fugle fandtes døde paa Dækket om Morgenen.

Praticola rubetra 1.

Ruticilla phoenicura 1.

20de Maj.

Vyl. Ø. S. Ø., Bramsejlskuling, skyet; en Stenpikker fandtes død.

Saxicola oenanthe 1.

25de Maj.

Vyl. N. Ø., Bramsejlskuling, skyet; en Løvsanger fandtes død paa Dækket om Morgenen.

Phyllopseustes trochilus 1.

27de Maj.

Hammeren. V. N. V., Merssejlskuling, skyet; en lille Fugl ved Fyret.

1ste August.

Lyngvig. S., laber Kuling, overtrukket; en Mudderklire faldt.

Actitis hypoleuca 1.

3dje August.

Drogden. Stille, Taage; mange Smaafugle ved Fyret; en Sivsanger faldt.

Acrocephalus phragmitis 1.

5te August.

Blaavands Huk. S. Ø., senere V., Bramsejlskuling, Regn; en Hjejle faldt (ikke indsendt). *Lyngvig.* N. Ø., rebet Merssejlskuling, Regntykning; 6 Fugle faldt. *Skagen.* V. N. V., Merssejlskuling, Regn; en Strandskade, en Mursvale og en Del mindre Fugle ved Fyret.

Charadrius squatarola. Lyngvig 1.

Hæmatopus ostreologus. Lyngvig 1.

Numenius arquatus. Lyngvig 1; 3 faldt.

Actitis hypoleuca. Lyngvig 1.

6te August.

Hanstholm. V. S. V., Bramsejlskuling, graat; en Strandhjejle faldt.

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Charadrius sqvatarola 1.

7de August.

Lyngvig. N. Ø., Bramsejlskuling, Regn; adskillige Fugle om Fyret; 6 faldt. *Vestborg.* N., Regn; en Regnspove faldt (ikke indsendt).

Charadrius sqvatarola. Lyngvig 1.
Charadrius pluvialis. Lyngvig 1.
Numenius arqvatus. Lyngvig 1.
Tringa canutus. Lyngvig 1.
Tringa alpina. Lyngvig 1.
Hypolais icterina. Lyngvig 1.

8de August.

Lyngvig. N. Ø., Bramsejlskuling, Regn; en Tinksmed faldt. *Stevns.* Ø. N. Ø., laber Kuling, Regn; 5 Fugle faldt.

Totanus glareola. Lyngvig 1.
Sylvia hortensis. Stevns 1.
Acrocephalus phragmitis. Stevns 3.
Phyllopseustes trochilus. Stevns 1.

13de August.

Lyngvig. V., Bramsejlskuling, overtrukket; Hjejler og Spover om Fyret; 2 Fugle faldt. *Lodbjerg.* S. Ø., laber Bramsejlskuling, Regntykning; flere Hjejler og Spover om Taarnet ved Midnat. *Rubjerg Knude.* Stille, Regn; mange Viber og Hjejler om Fyret. *Sejrø.* Ø. S. Ø., laber Bramsejlskuling, diset, Regn; 3 Fugle faldt.

Charadrius pluvialis. Lyngvig 1.
Numenius arqvatus. Lyngvig 1.
Limosa lapponica. Sejrø 1.
Cuculus canorus. Sejrø 1.
Cypselus apus. Sejrø 1.

14de August.

Sejrø. N. N. V., Bramsejlskuling, overtrukket, sigtbart; en Mudderklire faldt. *Stevns.* Ø. S. Ø., laber Kuling, Regntykning; en Strandhjejle faldt.

Charadrius sqvatarola. Stevns 1.

(1910.)

Actitis hypoleuca. Sejrø 1.

16de August.

Blaavands Huk. S. V., senere V., Merssejlskuling, graat, Dis, Smaaregn; en Del Smaafugle om Fyret; 3 Taarnsvaler og 4 andre Smaafugle faldt (ikke indsendte). *Lyngvig.* V. S. V., Merssejlskuling, overtrukket; Spover, Rødben, Præstekraver og en Del andre Fugle om Fyret; 5 Fugle faldt.

Crex pratensis. Lyngvig 1.

Ægialitis hiaticula. Lyngvig 1.

Numenius arqvatus. Lyngvig 1.

Cypselus apus. Lyngvig 1.

Sylvia hortensis. Lyngvig 1.

27de August.

Hammeren. Ø. S. Ø., Merssejlskuling, Regn; flere Smaafugle ved Fyret; 3 Gule Vipstjerter faldt; en Ellekrage fangedes levende paa Ruderne.

Motacilla flava 3.

30te August.

Blaavands Huk. S. S. Ø., laber Bramsejlskuling, graat, diset; en Del Smaafugle ved Fyret; 4 Svaler og 2 andre faldt (ikke indsendte). *Vyl.* S. V., Bramsejlskuling, skyet; en Del Fugle om Fyret; 6 faldt. *Lyngvig.* S. Ø., laber Kuling, overtrukket; Spover, Strandskader, Præstekraver og en Del mindre Fugle om Fyret; en Havesanger faldt. *Lodbjerg.* S. Ø., Bramsejlskuling, overtrukket, Dis; flere Smaafugle om Fyret; 4 faldt. *Rubjerg Knude.* S. Ø., Merssejlskuling, Regn; en Mængde Smaafugle opholdt sig ved Fyret hele Natten; en Munk faldt (ikke indsendt). *Anholt Knob.* S. Ø. Bramsejlskuling, overtrukket; en Rødstjert faldt. *Kjels Nor.* S. Ø., Merssejlskuling, senere Bramsejlskuling, overtrukket, Regn; 16 Fugle faldt. *Hyllekrog.* S. Ø., Bramsejlskuling, diset; en Mængde Smaafugle paa Ruderne; mange faldt; 26 indsendtes.

Cypselus apus. Lodbjerg 1.

Sylvia hortensis. Vyl 2. Lyngvig 1. Lodbjerg 1. Kjels Nor 4.

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Phyllopseustes trochilus. Lodbjerg 1. Kjels Nor 8. Hyllekrog 17.

Anthus arboreus. Vyl 3. Kjels Nor 1.

Saxicola oenanthe. Kjels Nor 2.

Ruticilla phoenicura. Anholt Knob 1. Hyllekrog 1.

Muscicapa atricapilla. Lodbjerg 1. Kjels Nor 1. Hyllekrog 8.

Emberiza hortulana. Vyl 1.

31te August.

Hammeren. Stille, Regn; en Mursvale og et Par andre Smaafugle ved Ruderne.

1ste September.

Lyngvig. V., Bramsejlskuling, Regn; Smaafugle om Fyret; en Islandsk Ryle faldt. *Lodbjerg.* V. N. V., Bramsejlskuling, Byger, Dis; nogle Smaafugle ved Ruderne efter Midnat. *Hanstholm.* V., laber Kuling, graat; en Del Smaafugle om Fyret fra Kl. 11 til 2; 11 faldt. *Hammeren.* N. N. V., laber Bramsejlskuling, diset; en lille Fugl ved Ruderne.

Tringa canutus. Lyngvig 1.

Sylvia hortensis. Hanstholm 2.

Phyllopseustes trochilus. Hanstholm 1.

Muscicapa atricapilla. Hanstholm 8.

2den September.

Hammeren. N. N. Ø., Bramsejlskuling, Regn; en Del Smaafugle paa Ruderne.

5te September.

Lodbjerg. N. N. Ø., torebet Merssejlskuling, overtrukket; 2 Smaafugle ved Ruderne før Midnat. *Anholt Knob.* N. Ø., Bramsejlskuling, overtrukket; Fugle ved Fyret; 2 Rødstjerter faldt. *Anholt.* N. Ø., Merssejlskuling, overtrukket; 26 Smaafugle faldt. *Vestborg.* N. Ø., Regndis; en Mudderklire faldt. *Sprogø.* Ø. S. Ø., laber Kuling, Regndis; efter Midnat faldt 6 Fugle.

Vanellus cristatus. Sprogø 1.

Actitis hypoleuca. Vestborg 1.

(1910.)

Cuculus canorus. Sprogø 1.

Sylvia cinerea. Anholt 1. Sprogø 1.

Sylvia curruca. Anholt 1.

Sylvia hortensis. Anholt 3.

Phyllopseustes trochilus. Anholt 10.

Saxicola oenanthe. Sprogø 1.

Ruticilla phoenicura. Anholt Knob 2. Anholt 11. Sprogø 2.

6te September.

Læsø Trindel. N. Ø., Bramsejlskuling, skyet; enkelte Fugle ved Fyret; 2 faldt. *Drogden.* Stille, Regn; en Del Smaafugle ved Fyret; en Broget Fluesnapper faldt. *Kjels Nor.* Stille, Regndis, senere N. Ø., Bramsejlskuling, overtrukket; 40 Fugle faldt. *Hammeren.* N., Merssejlskuling, Regn; en Del Smaafugle paa Ruderne; 1 faldt. *Gjedser Rev.* S. V., laber Kuling, Regn; 4 Gjøge og enkelte Rødkjælke ved Fyret; en Gjøg faldt paa Dækket. *Hyllekrog.* Stille og flov vestlig Vind, Regndis; en Mængde Smaafugle ved Ruderne; mange fangedes levende og bevaredes til Daggry, da de bleve løsladte.

Cuculus canorus. Kjels Nor 1. Gjedser Rev 1.

Sylvia hortensis. Kjels Nor 2.

Acrocephalus phragmitis. Kjels Nor 2.

Phyllopseustes trochilus. Læsø Trindel 1. Kjels Nor 3. Hammeren 1.

Saxicola oenanthe. Læsø Trindel 1. Kjels Nor 2.

Ruticilla phoenicura. Kjels Nor 8.

Muscicapa atricapilla. Drogden 1. Kjels Nor 22.

7de September.

Stevns. N. Ø., laber Kuling, overtrukket, Regntykning; 64 Fugle faldt. *Omø.* Ø. N. Ø., laber Bramsejlskuling, overtrukket; flere Smaafugle ved Fyret. *Æbelø.* Ø. N. Ø., Merssejlskuling, Byger; 6 Smaafugle ved Fyret. *Hammeren.* N. Ø., trerebet Merssejlskuling, Regnbyger; flere Smaafugle ved Ruderne, blandt dem en Vendehals. *Hyllekrog.* N. og N. Ø., flov Kuling, Regn; ikke faa Smaafugle paa Ruderne.

Eudromias morinellus. Stevns 2.

Sylvia curruca. Stevns 4.

Sylvia atricapilla. Stevns 2.

Sylvia hortensis. Stevns 6.

Phyllopseustes trochilus. Stevns 21.

Anthus arboreus. Stevns 2.

Saxicola oenanthe. Stevns 3.

Praticola rubetra. Stevns 2.

Ruticilla phoenicura. Stevns 15.

Erithacus rubecula. Stevns 1.

Muscicapa atricapilla. Stevns 5.

Muscicapa grisola. Stevns 1.

8de September.

Vyl. N. Ø., Bramsejlskuling, skyet; mange Smaafugle ved Fyret; en Rødstjert faldt. *Læsø Trindel.* Ø. N. Ø., Bramsejlskuling, skyet; enkelte Fugle ved Fyret; 6 faldt. *Anholt Knob.* N. Ø., Bramsejlskuling, overtrukket; Fugle om Fyret. *Omø.* N. N. Ø., laber Bramsejlskuling, skyet; flere Smaafugle ved Ruderne. *Gjedser Rev.* N. Ø., Bramsejlskuling, Regnbyger; omtrent 50 Fugle om Fyret; 5 faldt paa Dækket.

Phyllopseustes trochilus. Læsø Trindel 2. Gjedser Rev 1.

Saxicola oenanthe. Læsø Trindel 2. Gjedser Rev 1.

Ruticilla phoenicura. Vyl 1. Læsø Trindel 1. Gjedser Rev 1.

Erithacus rubecula. Gjedser Rev 2.

Muscicapa atricapilla. Læsø Trindel 1.

9de September.

Lodbjerg. N. N. Ø., laber Bramsejlskuling, overtrukket; enkelte Smaafugle ved Ruderne efter Midnat. *Nordre Røn.* N. Ø., Bramsejlskuling, overtrukket; flere Fugle om Fyret; 3 faldt (ikke indsendte). *Gjedser Rev.* N. Ø., Bramsejlskuling, Regnbyger; en Spurvehøg og omtrent 25 Vipstjerter ved Fyret.

(*Alauda arvensis.* Nordre Røn 1.)

(*Sturnus vulgaris.* Nordre Røn 2.)

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10de September.

Blaavands Huk. N. Ø., laber Kuling, graat; en Bekkasin og en lille Fugl faldt (ikke indsendte). *Vyl.* N. Ø., Bramsejlskuling, graat; en Del Smaafugle om Fyret; 4 faldt; en Høg sad i Rigningen hele Natten. *Lyngvig.* N. N. Ø., laber Kuling, overtrukket; Strandskader, Præstekraver, Hjejler og en hel Del mindre Fugle ved Fyret; 6 Fugle faldt. *Nordre Røn.* Ø., Bramsejlskuling, overtrukket; enkelte Smaafugle om Fyret; en Solsort og en Stær faldt (ikke indsendte). *Læsø Trindel.* Ø. S. Ø., laber Bramsejlskuling, Regnbyger; enkelte Fugle ved Fyret; 3 faldt. *Anholt Knob.* N. Ø., Bramsejlskuling, overtrukket; Fugle om Fyret. *Omø.* N. Ø., Bramsejlskuling, Regn og Dis; enkelte Smaafugle om Fyret.

Hæmatopus ostreologus. Lyngvig 1.

Tringa alpina. Lyngvig 1.

Limnocryptes gallinula. Lyngvig 1.

(*Sturnus vulgaris.* Nordre Røn 1.)

Sylvia hortensis. Lyngvig 1.

Turdus musicus. Vyl 1.

Saxicola oenanthe. Vyl 3. Læsø Trindel 2.

Ruticilla phoenicura. Lyngvig 1. Læsø Trindel 1.

Muscicapa atricapilla. Lyngvig 1.

11te September.

Vyl. N. N. Ø., Bramsejlskuling, skyet; flere Smaafugle om Fyret; en Enkelt Bekkasin faldt paa Dækket; nogle Fugle faldt overbord. *Lyngvig.* N., laber Kuling, overtrukket; Fugle om Fyret; 3 faldt. *Lodbjerg.* N., laber Kuling, overtrukket; nogle Smaafugle ved Ruderne. *Hanstholm.* N. Ø., laber Kuling, graat; en Mængde Smaafugle om Fyret fra Kl. 11 til 5; 21 faldt. *Rubjerg Knude.* N. Ø., laber Bramsejlskuling, overtrukket; en Del Fugle om Fyret hele Natten; 10 faldt. *Skagen.* Østlig flov Kuling, overtrukket; en stor Mængde Smaafugle, mest Rødstjerter, om Fyret hele Natten; 7 faldt.

Rallus aqvaticus. Lyngvig 1.

Charadrius sqvatarola. Rubjerg Knude 1; 5 faldt.

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Limnocryptes gallinula. Vyl 1.

Sylvia cinerea. Hanstholm 2.

Sylvia hortensis. Skagen 2.

Phyllopseustes trochilus. Lyngvig 1. Skagen 2.

Saxicola oenanthe. Hanstholm 1.

Ruticilla phoenicura. Hanstholm 13. Rubjerg Knude 1; 5 faldt. Skagen 1.

Erithacus rubecula. Lyngvig 1. Hanstholm 1. Skagen 1.

Muscicapa atricapilla. Hanstholm 4. Skagen 1.

12te September.

Lyngvig. N. V., Bramsejlskuling, overtrukket; 2 Smaafugle faldt. *Lodbjerg.* V. N. V., laber Kuling, overtrukket, Dis; nogle Rødstjerter ved Ruderne. *Rubjerg Knude.* Stille, Taage; mange Fugle ved Fyret fra Midnat til Dag. *Anholt Knob.* S. Ø., Bramsejlskuling, overtrukket; 2 Fugle faldt. *Lappegrund.* S. Ø., overtrukket, diset; en Mængde Smaafugle om Skibet; en Rødkjælk faldt. *Drogden.* N. Ø., laber Kuling, Dis, Regnbyger; 4 Fugle faldt. *Hammeren.* Ø. S. Ø., Bramsejlskuling, Regn og Dis; mange Smaafugle ved Ruderne, blandt dem en Gjøg og en Vendehals.

Phyllopseustes trochilus. Anholt Knob 1.

Saxicola oenanthe. Lyngvig 1.

Ruticilla phoenicura. Anholt Knob 1. Drogden 1.

Erithacus rubecula. Lappegrund 1. Drogden 1.

Muscicapa atricapilla. Lyngvig 1. Drogden 2.

13de September.

Lodbjerg. Ø. S. Ø., laber Kuling, Dis; nogle Smaafugle ved Ruderne; 2 faldt. *Lappegrund.* S., diset; nogle Smaafugle ved Fyret. *Hammeren.* S. Ø., laber Bramsejlskuling, overtrukket; en Del Smaafugle ved Fyret; en Lærke faldt. *Hyllekrog.* Stille, smukt Vejr; mange Smaafugle om Fyret.

Alauda arvensis. Hammeren 1.

Sylvia hortensis. Lodbjerg 1.

Ruticilla phoenicura. Lodbjerg 1.

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14de September.

Vyl. N. Ø., Bramsejlskuling, Regn; en Del Smaafugle om Fyret; 9 faldt. *Lyngvig.* Ø. N. Ø., Bramsejlskuling, overtrukket; Smaafugle om Fyret; 2 faldt. *Lodbjerg.* N. Ø., laber Kuling, Dis; nogle Rødstjerter ved Ruderne. *Østre Flak.* Ø., laber Kuling, klart; en Stenpikker faldt. *Anholt Knob.* Ø., Bramsejlskuling, overtrukket; en Fuglekonge paa Skibet, blev tagen af en Hund. *Lappegrund.* Ø., skyet; Smaafugle ved Fyret. *Kjels Nor.* N. Ø., Bramsejlskuling, overtrukket, Regndis; 15 Fugle faldt.

Sylvia hortensis. Lyngvig 1. Kjels Nor 3.

Phyllopseustes trochilus. Kjels Nor 3.

Regulus cristatus. Anholt Knob 1.

Saxicola oenanthe. Vyl 9. Lyngvig 1. Østre Flak 1.

Ruticilla phoenicura. Kjels Nor 8.

Erithacus rubecula. Kjels Nor 1.

15de September.

Horns Rev. N. Ø., overtrukket; omtrent 50 Smaafugle om Fyret; 18 faldt. *Lyngvig.* N. Ø., laber Kuling, overtrukket; 6 Fugle faldt. *Lodbjerg.* N. N. V., laber Kuling, overtrukket, Dis; mange Smaafugle om Fyret; en Rødstjert faldt. *Rubjerg Knude.* V., laber Kuling, overtrukket; mange Fugle om Fyret fra Midnat til Daggry; 11 faldt (6 indsendte). *Nordre Røn.* S. S. V., laber Bramsejlskuling, diset; mange Smaafugle om Fyret; en Rødkjælk faldt (ikke indsendt). *Læsø Rende.* Vestlig laber Kuling, overtrukket; flere Smaafugle om Fyret. *Østre Flak.* Stille, Taage; flere Smaafugle ved Fyret; 2 faldt.

Porzana maruetta. Lyngvig 1.

Limnocryptes gallinula. Rubjerg Knude 1.

Alauda arvensis. Lyngvig 1.

Sylvia atricapilla. Lyngvig 1. Rubjerg Knude 1.

Sylvia hortensis. Horns Rev 5. Lyngvig 1. Rubjerg Knude 1.

Turdus musicus. Rubjerg Knude 2.

Saxicola oenanthe. Horns Rev 4. Lyngvig 1. Rubjerg Knude 1. Østre Flak 1.

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Ruticilla phoenicura. Horns Rev 7. Lyngvig 1. Lodbjerg 1.

Erithacus rubecula. Østre Flak 1.

Cyanecula suecica. Horns Rev 1.

Muscicapa atricapilla. Horns Rev 1.

17de September.

Blaavands Huk. N. N. V., Merssejlskuling, graat; en „Lærkefalk“ faldt (ikke indsendt).

23de September.

Vyl. V. N. V., Bramsejlskuling, skyet; en Engpiber faldt.

Anthus pratensis 1.

24de September.

Nordre Røn. V. N. V., klosrebet Merssejlskuling, overtrukket, Regn; en Lærke faldt.

(*Alauda arvensis* 1.)

28de September.

Blaavands Huk. N. N. V., graat, diset; en Sneppe og 2 Drosler faldt (ikke indsendte). *Vyl.* N. V., laber Bramsejlskuling, graat; en Del Smaafugle ved Fyret; nogle faldt i Vandet. *Lyngvig.* V. N. V., laber Kuling, overtrukket; en Del Drosler om Fyret; 2 Fugle faldt. *Lodbjerg.* N. V., laber Kuling, Dis; nogle Smaafugle ved Fyret; 3 faldt. *Hammeren.* N. Ø., Bramsejlskuling, diset; en Fuglekonge paa Ruderne.

Limnocryptes gallinula. Lyngvig 1.

Sylvia hortensis. Lodbjerg 1.

Turdus iliacus. Lyngvig 1.

Turdus musicus. Lodbjerg 2.

29de September.

Hammeren. V. S. V., laber Bramsejlskuling, diset; 2 Stære, en Rødkjælk og en Del Fuglekonger paa Ruderne.

30te September.

Blaavands Huk. S. V., Bramsejlskuling, Regn, diset; en Ryle faldt (ikke indsendt). *Vyl.* V. N. V., laber Bramsejlskuling, Regn; en Del Smaafugle ved Fyret; en Enkelt Bekkasin faldt. *Lyngvig.* V., laber Kuling, overtrukket; en Del Hjejler om Fyret;

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2 Fugle faldt. *Skagen.* V. N. V., rebet Merssejlskuling, diset; enkelte Drosler og andre ved Fyret; 3 Fugle faldt. *Nordre Røn.* V. S. V., Bramsejlskuling, diset; en lille Fugl faldt (ikke indsendt). *Vestborg.* S. V., Taage; en Vibe faldt (ikke indsendt).

Oedemia nigra. Skagen 2.

Charadrius pluvialis. Lyngvig 1.

Limnocryptes gallinula. Vyl 1. Lyngvig 1.

Phyllopseustes rufus. Skagen 1.

2den Oktober.

Lodbjerg. S., laber Kuling, skyet, Dis; en lille Fugl ved Ruderne efter Midnat. *Nordre Røn.* V., Bramsejlskuling, diset; en Lærke og en Rødkjælk faldt (ikke indsendte). *Østre Flak.* V., laber Kuling, skyet og overtrukket; 30 Fugle faldt paa Dækket, flere i Vandet. *Møen.* N. V., laber Bramsejlskuling, diset; en Rødkjælk faldt (ikke indsendt).

Alauda arvensis. (Nordre Røn 1.) Østre Flak 4; 10 faldt.

Turdus musicus. Østre Flak 2.

Erithacus rubecula. Østre Flak 4; 14 faldt.

Emberiza schoeniclus. Østre Flak 4.

3dje Oktober.

Blaavands Huk. S., Merssejlskuling, Regnbyger, diset; 5 Drosler faldt (ikke indsendte). *Vyl.* S. S. V., Bramsejlskuling, skyet; en Del Lærker og Stære ved Fyret; en Lærke faldt. *Lyngvig.* S. S. Ø., Bramsejlskuling, overtrukket; mange Stære og enkelte Drosler om Fyret; 5 Fugle faldt. *Lodbjerg.* S. Ø., Merssejlskuling, overtrukket, Dis; mange Stære ved Ruderne. *Hanstholm.* S. Ø., Bramsejlskuling, graat; en Del Lærker, Stære og Drosler ved Fyret fra Kl. 10 til Dag; 6 Lærker faldt. *Anholt Knob.* S. Ø., Merssejlskuling, skyet; enkelte Fugle ved Fyret. *Sejrø.* S. Ø., torebet Merssejlskuling, overtrukket, diset; Smaafugle om Fyret; 5 faldt (ikke indsendte).

Alauda arvensis. Vyl 1. (Hanstholm 6.)

Turdus musicus. Lyngvig 1; 4 faldt.

Praticola rubetra. Lyngvig 1.

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5te Oktober.

Blaavands Huk. N., Bramsejlskuling, overtrukket; 2 Drosler faldt (ikke indsendte). *Vyl.* N. N. V., Bramsejlskuling, Regn; flere Fugle om Fyret; 3 faldt. *Horns Rev.* N. V., overtrukket; omtrent 200 forskjellige Smaafugle ved Fyret; 22 faldt paa Dækket, en Del i Vandet. *Lyngvig.* N. V., Bramsejlskuling, skyet; 2 Fugle faldt.

Alauda arvensis. Horns Rev 3.

Troglodytes parvulus. Lyngvig 1.

Turdus iliacus. Horns Rev 7.

Turdus musicus. Vyl 1. Horns Rev 2. Lyngvig 1.

Erithacus rubecula. Horns Rev 1.

Fringilla coelebs. Vyl 1.

Fringilla montifringilla. Horns Rev 8.

Chrysomitris spinus. Vyl 1. Horns Rev 1.

6te Oktober.

Horns Rev. N. V., tykskyet; enkelte Fugle ved Fyret; 6 faldt. *Lyngvig.* V. N. V., Bramsejlskuling, skyet; en Vindrossel faldt. *Hesselø.* N. V., Merssejlskuling, klart; 2 Graaænder faldt (ikke indsendte). *Stevns.* V. S. V., laber Kuling, overtrukket, Regnbyger; 6 Fugle faldt. *Hammeren.* V., Merssejlskuling, skyet; en Flok Stære paa Ruderne. *Hyllekrog.* Vestlig Vind, Regnbyger; en Del Smaafugle ved Ruderne; 4 faldt.

Alauda arvensis. Horns Rev 2. Stevns 4.

Acrocephalus arundinaceus. Stevns 1.

Regulus cristatus. Hyllekrog 2.

Anthus obscurus. Horns Rev 1.

Turdus iliacus. Horns Rev 1. Lyngvig 1.

Erithacus rubecula. Stevns 1. Hyllekrog 2.

Emberiza schoeniclus. Horns Rev 2.

7de Oktober.

Lyngvig. N. V., Bramsejlskuling, overtrukket; mange Stære og Drosler ved Fyret; 7 Drosler faldt. *Hammeren.* N. N. V., Merssejlskuling, klart; en Fuglekonge ved Ruderne. *Gjedser Rev.* N. V., laber Bramsejlskuling, Regn; flere Fugle ved Fyret; 10 faldt.

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Alauda arvensis. Gjedser Rev 2.

Turdus iliacus. Lyngvig 1; 7 faldt.

Turdus musicus. Gjedser Rev 5.

Turdus torqvatus. Gjedser Rev 1.

Erithacus rubecula. Gjedser Rev 2.

8de Oktober.

Nordre Røn. V., Merssejlskuling, overtrukket; en Solsort og en Fuglekonge faldt (ikke indsendte). *Hammeren.* V., Bramsejlskuling, overtrukket; omtrent 20 Fuglekonger paa Ruderne.

10de Oktober.

Horns Rev. N. V., overtrukket; omtrent 300 forskjellige Smaafugle om Fyret; 46 faldt paa Dækket, mange i Vandet. *Skjoldnæs.* V., overtrukket, sigtbart; en Vandrixe faldt. *Hammeren.* V. N. V., laber Kuling, overtrukket; en Mængde Smaafugle ved Ruderne; en Ugle fangede en Fugl og aad den. *Møen.* N. V., laber Kuling, diset; mange Smaafugle ved Ruderne; 7 Rødkjælke faldt (ikke indsendte).

Rallus aqvaticus. Skjoldnæs 1.

Alauda arvensis. Horns Rev 29.

Sturnus vulgaris. Horns Rev 2.

Anthus pratensis. Horns Rev 1.

Anthus obscurus. Horns Rev 1.

Turdus iliacus. Horns Rev 3.

Turdus musicus. Horns Rev 9.

Fringilla montifringilla. Horns Rev 1.

11te Oktober.

Blaavands Huk. S. V. og sydlig, graat, Regn; mange Smaafugle om Fyret; 27 Drosler, 3 Lærker og 8 andre Smaafugle faldt (ingen indsendte). *Vyl.* V., Bramsejlskuling, Regn; en Del Fugle om Fyret; 15 faldt. *Lyngvig.* S., laber Kuling, overtrukket; mellem 150 og 200 Smaafugle faldt (4 indsendte). *Lodbjerg.* S., laber Bramsejlskuling, overtrukket, Dis; nogle Fuglekonger, en Stær, en Drossel, en Rødkjælk ved Ruderne efter Midnat. *Skagen.* S. V., flov Kuling, diset; en Del Drosler, Stære og andre ved Fyret.

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Læsø Trindel. S. V., skyet; enkelte Fugle ved Fyret; en Sangdrossel faldt. ***Læsø Rende.*** V. N. V., laber Kuling, skyet; enkelte Fugle ved Fyret; 2 faldt. ***Anholt Knob.*** Stille, skyet; enkelte Fugle ved Fyret; en Rørspurv faldt. ***Sejrø.*** S. V., Bramsejlskuling, overtrukket, diset; stort Træk af Smaafugle; 4 faldt. ***Vestborg.*** S. S. V., Dis; 2 Lærker faldt. ***Kjels Nor.*** S. V., Bramsejlskuling, overtrukket, diset; 53 Fugle faldt. ***Hammeren.*** S., laber Kuling, overtrukket; mange Smaafugle ved Ruderne, deriblandt omtrent 50 Fuglekonger; 8 Fugle faldt. ***Dueodde Sydfyr.*** S. S. V., laber Kuling, skyet; en Stær flagrede paa Ruderne fra Kl. 12 til 5. ***Gjedser.*** S. V., overtrukket, diset; 10 Fugle faldt. ***Gjedser Rev.*** S. V., laber Bramsejlskuling, overtrukket; omtrent 50 Fugle ved Fyret; 35 faldt.

Tringa alpina. Gjedser 1.

Alauda arvensis. (Blaavands Huk 3.) Vyl 7. Lyngvig 1; 28 faldt. Læsø Rende 1. Sejrø 1. (Vestborg 2.) Kjels Nor 6. Hammeren 7. Gjedser 2. Gjedser Rev 12.

Sturnus vulgaris. Hammeren 1.

Sylvia atricapilla. Kjels Nor 1.

Acrocephalus arundinaceus. Kjels Nor 1.

Regulus cristatus. Sejrø 1.

Anthus pratensis. Vyl 1.

Turdus iliacus. Vyl 3. Lyngvig 1; 120 faldt. Kjels Nor 2. Gjedser 2. Gjedser Rev 1.

Turdus musicus. Vyl 4. Læsø Trindel 1. Læsø Rende 1. Kjels Nor 25. Gjedser 1. Gjedser Rev 11.

Turdus torqvatus. Lyngvig 1.

Erithacus rubecula. Sejrø 1. Kjels Nor 9. Gjedser 1. Gjedser Rev 5.

Muscicapa atricapilla. Sejrø 1.

Fringilla montifringilla. Lyngvig 1. Kjels Nor 9. Gjedser 3. Gjedser Rev 3.

Emberiza schoeniclus. Anholt Knob 1. Gjedser Rev 3.

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12te Oktober.

Blaavands Huk. S. og S. Ø., meget diset; mange Smaafugle ved Fyret; 61 Drosler og 4 andre faldt (ingen indsendte). *Vyl.* S. S. Ø., Merssejlskuling, skyet; en Del Fugle om Fyret; 40 faldt. *Lyngvig.* S. S. Ø., Bramsejlskuling, diset; Stære og Lærker om Fyret; 11 Fugle faldt. *Lodbjerg.* S., Merssejlskuling, overtrukket, Dis; nogle Stære, Lærker og en Drossel ved Ruderne efter Midnat; 5 Fugle faldt. *Sprogø.* S., Bramsejlskuling, Taage; en Lærke faldt. *Hammeren.* S., Merssejlskuling, diset; 11 Stære paa Ruderne; 3 Fugle faldt, blandt dem en Lærke (ingen indsendte). *Gjedser Rev.* S., laber Bramsejlskuling, diset; kun faa Fugle ved Fyret; 9 faldt.

Limnocryptes gallinula. Lodbjerg 2.

Gallinago scolopacina. Lyngvig 1.

Alauda arvensis. Vyl 2; 35 faldt. Lyngvig 1; 10 faldt. Lodbjerg 3. (Sprogø 1. Hammeren 1.) Gjedser Rev 4.

Sturnus vulgaris. Vyl 1.

Turdus iliacus. Vyl 1. Gjedser Rev 3.

Turdus musicus. Vyl 2. Gjedser Rev 1.

Erithacus rubecula. Gjedser Rev 1.

Fringilla coelebs. Vyl 1.

13de Oktober.

Blaavands Huk. Stille, omløbende og N. N. V., Bramsejlskuling, diset; mange Stære og andre Smaafugle ved Fyret; 17 Drosler faldt (ingen indsendte). *Lyngvig.* S. Ø., Bramsejlskuling, diset; mange Stære og enkelte Drosler om Fyret; 14 Fugle faldt. *Lodbjerg.* V., Merssejlskuling, overtrukket, Dis; flere Stære, Lærker og Drosler ved Ruderne; 6 Fugle faldt. *Østre Flak.* V. S. V., laber Bramsejlskuling, regndiset; mange Smaafugle ved Fyret hele Natten; 13 Fugle faldt. *Anholt Knob.* V., Bramsejlskuling, Regntykning; en Mængde Drosler om Fyret; 2 faldt. *Hammeren.* S. V., Bramsejlskuling, diset; en Del Fuglekonger paa Ruderne. *Gjedser Rev.* V. S. V., laber Bramsejlskuling, Dis; kun faa Fugle ved Fyret; 7 faldt.

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Anas penelops. Lodbjerg 1.

Rallus aqvaticus. Lyngvig 1.

Limnocryptes gallinula. Lodbjerg 1. Østre Flak 1.

Alauda arvensis. Lyngvig 1. Lodbjerg 3. Østre Flak 1. Gjedser Rev 5.

Sturnus vulgaris. Lyngvig 1; 12 faldt. Gjedser Rev 1.

Turdus iliacus. Østre Flak 3.

Turdus musicus. Lodbjerg 1. Østre Flak 7. Anholt Knob 2. Gjedser Rev 1.

Erithacus rubecula. Østre Flak 1.

14de Oktober.

Vyl. N. Ø., Merssejlskuling, skyet; en Fuglekonge faldt; flere Smaafugle hørtes.

Regulus cristatus 1.

15de Oktober.

Skagens Rev. S. V., laber Kuling, overtrukket; flere Stære ved Fyret. *Østre Flak.* V., laber Bramsejlskuling, overtrukket; 3 Fugle faldt. *Anholt Knob.* V. N. V., laber Kuling, let skyet: enkelte Smaafugle ved Fyret; en Fuglekonge faldt.

Troglodytes parvulus. Østre Flak 1.

Parus major. Østre Flak 1.

Regulus cristatus. Østre Flak 1. Anholt Knob 1.

16de Oktober.

Skagens Rev. Stille, overtrukket; flere Stære og andre Smaafugle ved Fyret; 3 Fugle faldt. *Nordre Røn.* N., laber Bramsejlskuling, Taage; flere Smaafugle om Fyret; 2 faldt (ikke indsendte).

Regulus cristatus. Skagens Rev 2.

Turdus musicus. Skagens Rev 1.

17de Oktober.

Lodbjerg. S. Ø., Bramsejlskuling, overtrukket, Dis; 2 Stære ved Ruderne efter Midnat.

19de Oktober.

Læsø Trindel. S. S. V., skyet; en Fuglekonge faldt.

Regulus cristatus 1.

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20de Oktober.

Nordre Røn. S. Ø., Bramsejlskuling, overtrukket, Regn; en Stær faldt.

(*Sturnus vulgaris* 1.)

22de Oktober.

Læsø Trindel. Ø., skyet; en Graasisken faldt.

Cannabina linaria 1.

23de Oktober.

Lodbjerg. Ø. N. Ø., Bramsejlskuling, overtrukket; 2 Fuglekonger ved Ruderne om Morgenen. *Østre Flak.* Ø. S. Ø., laber Bramsejlskuling, overtrukket; 3 Fugle faldt. *Hammeren.* Ø., rebet Merssejlskuling, overtrukket; en Graasisken faldt.

Cinclus aqvaticus. Østre Flak 1.

Cannabina linaria. Østre Flak 2. Hammeren 1.

24de Oktober.

Vyl. Ø. S. Ø., Merssejlskuling, skyet; nogle Smaafugle ved Fyret; 2 faldt. *Lodbjerg.* Ø., Bramsejlskuling, overtrukket; en Stær ved Ruderne paa Efternatten. *Hammeren.* Ø., rebet Merssejlskuling, overtrukket; 2 Fuglekonger paa Ruderne.

Sturnus vulgaris. Vyl 1.

Turdus musicus. Vyl 1.

25de Oktober.

Vyl. Ø. S. Ø., Bramsejlskuling, graat; en Del Smaafugle om Fyret; 3 faldt. *Sejrø.* Ø., torebet Merssejlskuling, overtrukket, diset; 6 Fugle faldt (2 indsendte).

Rallus aqvaticus. Sejrø 1.

Scolopax rusticula. Sejrø 1.

(*Alauda arvensis.* Sejrø 2.)

Sturnus vulgaris. Vyl 1. (Sejrø 2.)

Turdus merula. Vyl 1.

Cannabina linaria. Vyl 1.

26de Oktober.

Vyl. S. Ø., Merssejlskuling, graat; en Mængde Fugle ved Fyret; 33 faldt (18 indsendte). *Horns Rev.* S. Ø., overtrukket;

omtrent 50 Smaafugle ved Fyret; 16 Fugle faldt paa Dækket, flere i Vandet. *Lyngvig.* Ø. S. Ø., laber Kuling, skyet; 83 Fugle faldt. *Lodbjerg.* Ø., laber Bramsejlskuling, overtrukket, Dis; 2 Stære ved Ruderne.

Alauda arvensis. Vyl 3. Horns Rev 4. Lyngvig 1.

Sturnus vulgaris. Vyl 3. Horns Rev 9. Lyngvig 1; 31 faldt.

Regulus cristatus. Lyngvig 1.

Anthus pratensis. Vyl 1.

Turdus iliacus. Vyl 2. Lyngvig 1; 49 faldt.

Turdus musicus. Vyl 1.

Turdus pilaris. Vyl 1.

Turdus merula. Vyl 2. Horns Rev 2.

Fringilla montifringilla. Vyl 2.

Cannabina linaria. Vyl 3. Horns Rev 1. Lyngvig 1.

27de Oktober.

Blaavands Huk. Ø. S. Ø., Bramsejlskuling, graat, diset; mange Smaafugle ved Fyret; 29 Drosler faldt (ingen indsendte). *Vyl.* Ø. S. Ø., Bramsejlskuling, graat; en Mængde Smaafugle ved Fyret; 120 faldt paa Dækket (13 indsendte), flere i Vandet. *Horns Rev.* Ø., overtrukket; omtrent 100 forskjellige Smaafugle ved Fyret; 60 faldt paa Dækket (21 indsendte), mange i Vandet; en Raage opholdt sig i Rigningen hele Natten. *Lyngvig.* Ø. N. Ø., laber Kuling, overtrukket; 2 Fugle faldt. *Hanstholm.* Ø. N. Ø., Bramsejlskuling, overtrukket; enkelte Drosler om Fyret. *Hyllekrog.* Ø. S. Ø., Bramsejlskuling, Taage; mange Smaafugle paa Ruderne; en Sangdrossel faldt.

Alauda arvensis. Vyl 4. Horns Rev 13.

Sturnus vulgaris. Vyl 1. Horns Rev 4.

Regulus cristatus. Lyngvig 1.

Turdus iliacus. Vyl 2. Horns Rev 2. Lyngvig 1.

Turdus musicus. Horns Rev 1. Hyllekrog 1.

Turdus merula. Vyl 4.

Cannabina linaria. Vyl 2.

Emberiza schoeniclus. Horns Rev 1.

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28de Oktober.

Vyl. Ø. S. Ø., rebet Merssejlskuling, graat; enkelte Smaafugle ved Fyret; 6 faldt. *Horns Rev.* Ø., overtrukket; enkelte Fugle ved Fyret. *Lyngvig.* Ø., Bramsejlskuling, overtrukket; 10 Sjaggere faldt. *Lodbjerg.* Ø., Merssejlskuling, overtrukket, Dis; 3 Fugle faldt; en Stær og en Lærke sete ved Ruderne. *Nordre Røn.* S. Ø., enrebet Merssejlskuling, overtrukket; 2 Sjaggere faldt (ikke indsendte). *Læsø Rende.* S. Ø., laber Kuling, overtrukket; flere Fugle ved Fyret. *Østre Flak.* Ø. S. Ø., Merssejlskuling, overtrukket; mange Smaafugle ved Fyret; 5 faldt. *Anholt.* Ø. S. Ø., Merssejlskuling, overtrukket; en Del Sjaggere ved Ruderne.

Alauda arvensis. Vyl 1.

Turdus iliacus. Lodbjerg 2.

Turdus musicus. Vyl 1; 5 faldt.

Turdus pilaris. Lyngvig 1; 10 faldt. Østre Flak 4.

Fringilla montifringilla. Østre Flak 1.

Cannabina linaria. Lodbjerg 1.

29de Oktober.

Blaavands Huk. Ø., laber Kuling, Taage, diset; mange Smaafugle ved Fyret; 3 faldt (ikke indsendte). *Vyl.* Ø. S. Ø., laber Kuling, graat; enkelte Smaafugle ved Fyret; 14 Fugle faldt; nogle Rødkjælke opholdt sig paa Dækket ved Morgen. *Horns Rev.* Ø. S. Ø., Regnbyger; omtrent 50 forskjellige Smaafugle ved Fyret; 17 faldt paa Dækket (8 indsendte), en Del i Vandet. *Lyngvig.* Ø., laber Kuling, Regn; 68 Fugle faldt. *Lodbjerg.* Ø., Bramsejlskuling, overtrukket, Regn og Dis; Stære, Rødkjælke og Fuglekonger ved Ruderne; 3 Fugle faldt. *Skagen.* Ø. S. Ø. og Ø., Bramsejlskuling, Regn; en Del Graasiskener ved Ruderne; 5 Fugle faldt. *Anholt.* Ø. S. Ø., Merssejlskuling, Regn og Dis; 59 Fugle faldt paa Land, flere i Søen. *Hesselø.* S. Ø., Bramsejlskuling; 32 Fugle faldt, mest Drosler (ingen indsendte). *Hjelm.* S. S. Ø., laber Kuling, Regn; enkelte Fugle ved Ruderne; 2 faldt. *Sejrø.* S. Ø., ustadig Kuling fra enrebet Merssejlskuling til laber Kuling, Regntykning; Smaafugle om Fyret, mest Stære, Drosler og Lærker;

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3 Fugle faldt. *Stevns.* V., laber Kuling, Taage; 14 Fugle faldt. *Sprogø.* S., laber Kuling, diset; 5 Fugle faldt. *Omø.* Ø. N. Ø., Bramsejlskuling, Regndis; en Del Smaafugle ved Fyret; flere faldt (ingen indsendte). *Kjels Nor.* S. Ø., Merssejlskuling, Regn; 13 Fugle faldt. *Hammeren.* S., laber Kuling, diset; 6 Stære og 2 andre Smaafugle paa Ruderne. *Gjedser.* S., overtrukket, Støvregn; flere Smaafugle om Fyret; en Stær faldt. *Gjedser Rev.* V. S. V., laber Bramsejlskuling, overtrukket; omtrent 50 Smaafugle om Fyret; 12 faldt. *Hyllekrog.* Mellem S. S. Ø. og S. V., flov Kuling, Regntykning; en Mængde Fugle, mest Stære, ved Ruderne; 3 faldt.

Rallus aqvaticus. Sejrø 1.

Fulica atra. Vyl 1.

Tringa maritima. Anholt 1.

Scolopax rusticula. Sejrø 1.

Alauda arvensis. Horns Rev 2. Lyngvig 1; 14 faldt. Anholt 1. Gjedser Rev 3.

Sturnus vulgaris. Vyl 1. Horns Rev 1. Stevns 1. Kjels Nor 1. Gjedser 1. Gjedser Rev 7. Hyllekrog 3.

Regulus cristatus. Lyngvig 1. Stevns 3.

Turdus iliacus. Vyl 1; 12 faldt. Lyngvig 1; 52 faldt. Lodbjerg 2. Skagen 2. Anholt 3; 34 faldt. Hjelm 1. Sejrø 1. Stevns 1. Sprogø 3. Kjels Nor 9.

Turdus musicus. Stevns 1. Kjels Nor 2.

Turdus pilaris. Anholt 1; 19 faldt. Hjelm 1. Sprogø 2. Kjels Nor 1.

Turdus merula. Anholt 1.

Erithacus rubecula. Horns Rev 4. Lyngvig 1. Anholt 1. Stevns 5. Gjedser Rev 1.

Fringilla montifringilla. Lodbjerg 1. Anholt 1.

Cannabina linaria. Skagen 3. Stevns 2. Gjedser Rev 1.

Emberiza nivalis. Horns Rev 1. Anholt 1. Stevns 1.

30te Oktober.

Blaavands Huk. Ø. N. Ø., Bramsejlskuling, diset, Regntykning;

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store Flokke af Fugle om Fyret; omtrent 300 Smaafugle faldt, Drosler, Lærker, Stære og andre (ingen indsendte). *Vyl.* Ø. N. Ø., Merssejlskuling, Regn; en Mængde Fugle ved Fyret; 103 faldt paa Dækket (15 indsendte), omtrent 200 i Vandet. *Horns Rev.* Ø. N. Ø., overtrukket; omtrent 150 Smaafugle ved Fyret; 35 faldt paa Dækket (20 indsendte), mange i Vandet. *Lyngvig.* Ø. N. Ø., laber Kuling, Regn; 306 Fugle faldt. *Anholt Knob.* N. N. Ø., laber Bramsejlskuling, skyet; Fugle om Fyret. *Kjels Nor.* Ø., Bramsejlskuling, Taage, senere overtrukket, Regn; 6 Fugle faldt. *Hammeren.* N. Ø., Bramsejlskuling, diset; en Mængde Fuglekonger og andre Smaafugle paa Ruderne. *Møen.* N. Ø. og stille, regndiset; 2 Drosler, 1 Stær og 1 Rødkjælk faldt (ikke indsendte). *Hyllekrog.* Østlig laber Kuling; mange Smaafugle paa Ruderne.

Scolopax rusticula. Kjels Nor 2.

Falco peregrinus. Vyl 1.

Alauda arvensis. Vyl 2; 13 faldt. Horns Rev 4. Lyngvig 1: 147 faldt.

Sturnus vulgaris. Vyl 2; 6 faldt. Horns Rev 11. Lyngvig 1: 48 faldt. (Møen 1.)

Sylvia atricapilla. Lyngvig 1.

Anthus pratensis. Vyl 1.

Turdus iliacus. Vyl 1; 64 faldt. Horns Rev 3. Lyngvig 1: 101 faldt. Kjels Nor 2.

Turdus pilaris. Vyl 1; 7 faldt. Kjels Nor 2.

Turdus merula. Vyl 3. Lyngvig 1; 7 faldt.

Erithacus rubecula. Vyl 1. Horns Rev 1. Lyngvig 1.

Fringilla coelebs. Vyl 1.

Cannabina linaria. Vyl 1. Horns Rev 1.

Emberiza nivalis. Vyl 1. Lyngvig 1.

31te Oktober.

Læsø Trindel. S., skyet; enkelte Smaafugle ved Fyret. *Romsø.* 2 Lærker faldt. *Hov.* N. Ø., Bramsejlskuling, Taage og Regn; en Rødkjælk faldt. *Kjels Nor.* N. Ø., Bramsejlskuling, overtrukket; en Rørhøne faldt. *Hyllekrog.* Ø. S. Ø. og S. Ø. med tiltagende

Kuling; mange Smaafugle ved Fyret; en enkelt faldt (ikke indsendt).

Gallinula chloropus. Kjels Nor 1.

(*Alauda arvensis.* Romsø 2.)

Erithacus rubecula. Hov 1.

1ste November.

Vyl. S. S. V., torebet Merssejlskuling, Regnbyger; enkelte Fugle ved Fyret; 2 faldt. *Sprogø.* S. S. V., stormende Kuling, regndiset; 6 Fugle faldt. *Kjels Nor.* S., senere S. Ø., Bramsejlskuling stigende til klosrebet Merssejlskuling, overtrukket, Byger; 12 Fugle faldt. *Gjedser.* S. S. V., overtrukket, Regn; 2 Fugle faldt.

Limnocryptes gallinula. Sprogø 1. Gjedser 1.

Alauda arvensis. Sprogø 1; 3 faldt. Kjels Nor 1.

Sturnus vulgaris. Vyl 1.

Regulus cristatus. Gjedser 1.

Turdus iliacus. Sprogø 1. Kjels Nor 7.

Turdus pilaris. Vyl 1. Sprogø 1. Kjels Nor 2.

Turdus merula. Kjels Nor 1.

Emberiza citrinella. Kjels Nor 1.

2den November.

Nordre Røn. Stille, skyet; enkelte Smaafugle om Fyret; en Lærke og en Sjagger faldt (ikke indsendte).

(*Alauda arvensis* 1.)

4de November.

Blaavands Huk. S. Ø., laber Bramsejlskuling, diset; 2 Drosler faldt (ikke indsendte).

5te November.

Gjedser Rev. V. S. V., Bramsejlskuling, overtrukket; omtrent 25 Lærker ved Fyret; 8 faldt.

(*Alauda arvensis* 8.)

6te November.

Østre Flak. S. S. Ø., laber Kuling, skyet; en Enkelt Bekkasin faldt.

Limnocryptes gallinula 1.

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7de November.

Lyngvig. S. S. Ø., torebet Merssejlskuling, overtrukket; en Taffeland faldt. *Hanstholm.* Ø. S. Ø., Merssejlskuling, Regn; en Sneppe ved Ruderne Kl. 2; 4 Ænder flagrede om Fyret. *Nordre Røn.* S. Ø., Merssejlskuling, Regnbyger; 2 Smaafugle faldt (ikke indsendte). *Sprogø.* S. S. Ø., Storm, Regn; en Stær faldt.

Fuligula ferina. Lyngvig 1.

(*Sturnus vulgaris.* Sprogø 1.)

8de November.

Fornæs. V. S. V., Bramsejlskuling, skyet; en Graaand faldt (ikke indsendt). *Ærøe.* S. V., torebet Merssejlskuling, Regntykning; en Del Stære paa Ruderne; en Ringdue faldt.

Columba palumbus. Ærøe 1.

9de November.

Østre Flak. V., Bramsejlskuling, skyet; 2 Snespurve faldt.

Emberiza nivalis 2.

11te November.

Skagens Rev. Ø. N. Ø., Bramsejlskuling, overtrukket; en Stormsvale faldt og opholdt sig ombord, gaaende paa Dækket, i nogle Dage, inden den døde; den drak Vand, men vilde ikke æde noget. *Østre Flak.* V. S. V., laber Bramsejlskuling, skyet; en Sjagger faldt.

Procellaria pelagica. Skagens Rev 1.

Turdus pilaris. Østre Flak 1.

12te November.

Horns Rev. To Fugle fandtes døde paa Dækket om Morgenen. *Dueodde Nordfyr.* S. Ø., Bramsejlskuling, Regn; en Stokand faldt.

Anas boscas. Dueodde Nordfyr 1.

Limnocryptes gallinula. Horns Rev 1.

Turdus merula. Horns Rev 1.

13de November.

Vyl. Ø. S. Ø., Bramsejlskuling, Regn; enkelte Fugle ved Fyret; 2 faldt.

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Sturnus vulgaris 1.

Turdus merula 1.

14de November.

Nordre Røn. Ø. S. Ø., Storm, Snebyger; 3 Smaafugle ved Ruderne; en Rødkjælk faldt (ikke indsendt). *Hammeren.* S. Ø., enrebet Merssejlskuling, diset; en Stær paa Ruderne.

22de November.

Nordre Røn. N. Ø., enrebet Merssejlskuling; en Solsort faldt (ikke indsendt).

28de November.

Læsø Trindel. S., klosrebet Merssejlskuling, overtrukket; en Snespurv faldt.

Emberiza nivalis 1.

29de November.

Nordre Røn. S. S. Ø., klosrebet Merssejlskuling; enkelte Smaafugle om Fyret.

2den December.

Kjels Nor. N. N. Ø., Bramsejlskuling, overtrukket; en Ringdue faldt.

Columba palumbus 1.

6te December.

Vestborg. S. Ø., Taage og Dis; en Graaand faldt (ikke indsendt). *Omø.* S. Ø. til S., torebet Merssejlskuling, overtrukket; en Blishøne faldt,

Fulica atra. Omø 1.

8de December.

Blaavands Huk. S. V., senere S. Ø., Bramsejlskuling, Regntykning, Taage; en Blishøne faldt (ikke indsendt). *Læsø Trindel.* S. V., Taage; en lille Fugl faldt (ikke indsendt). *Omø.* V. S. V., laber Bramsejlskuling, overtrukket, diset; Smaafugle ved Ruderne; en faldt (ikke indsendt).

9de December.

Blaavands Huk. S. Ø., enrebet Merssejlskuling, diset; en Lom faldt (ikke indsendt).

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11te December.

Læsø Rende. S. Ø., Merssejlskuling, overtrukket; en Lom faldt.

Colymbus septentrionalis 1.

14de December.

Læsø Rende. S. S. Ø., Merssejlskuling, overtrukket; en Gulspurv faldt.

Emberiza citrinella 1.

18de December.

Skagens Rev. V., laber Bramsejlskuling, overtrukket; flere Smaafugle ved Fyret.

Forskjellige Iagttagelser fra Fyrene.

Vyl Fyrskib. 20de Januar et Par Lærker set. 7de Februar smaa Flokke Lærker og Stære sete. Marts: *12te* et Par Høge set. *24de* enkelte Raager og Lærker flyvende Ø. April: *2den* en Vipstjert en Tid paa Skibet. *14de* en Bogfinke paa Skibet ved Middag. Maj: *5te* en lille Sangfugl paa Dækket, flere Terner om Skibet. *13de* flere Smaafugle flyvende rundt om Skibet, nogle opholdende sig paa Dækket. *14de*, *15de* og *16de* i smukt Vejr en Mængde smaa Sangfugle ombord, mest jagende efter Fluer paa Dækket. 14de September en Rødstjert paa Dækket, Regnspover om Eftermiddagen S. V. Oktober: *4de* en Skovdue sad paa Dækket om Morgenen, flere Smaafugle fløj om Skibet. *23de* en Del Stære, nogle Lærker og Vipstjerter opholdt sig ombord. *25de* og *26de* Bogfinker ombord. *29de* om Aftenen fløj 4 Høge S. V.; en opholdt sig paa Skibet. — J. S. Jensen, A. H. Schmidt.

Horns Rev Fyrskib. 26de Februar omtrent 100 Raager i Flok fra V. mod Ø. Marts: *6te* to Flokke Raager paa 50 og 15 mod Ø. *27de* omtr. 50 Viber i Flok S. Ø. Oktober: *23de* 10 Raager mod S. *24de* omtr. 30 Raager i Flok mod S.; om Eftermiddagen kom 2 Stære, satte sig paa Lønningen en kort Tid og fløj derefter S. *29de* 12 Krager S.; forskjellige Smaafugle paa Skibet hele Dagen; en Høg kom ved Aften ved Fyrets Hejsning,

kredsede nogle Gange om Skibet og fløj derefter bort. — H. Sonnichsen, C. E. Søjborg.

Thyborøn. 21de Januar mellem 200 og 300 Stære i Flok. 25de Februar 2 Strandskader paa Stranden. Marts: *3dje* en Del Krager N. Ø. *4de* en Del Vildænder fra N. svingende ind i Fjorden; Viber og Lærker hørtes. *17de* en Flok Vildænder fra N. ind i Fjorden. *21de* en Flok Gjæs ind i Fjorden. *30te* en Del Krager N. April: *15de* 30 Krager i Flok N. Ø. *18de* 7 Regnspover i Flok Ø., 11 Krager S., 30 Svaner N. 29de August to Flokke Vildgjæs ind over Fjorden. September: *9de* flere store Flokke Vildgjæs fra N. *13de* 8 Flokke Vildgjæs S. Ø. Oktober: *14de* 17 Krager i Flok mod S. V. *17de* flere Flokke Krager fra N. Ø. *18de* 30 til 40 Flokke Vildgjæs fra N. ind over Fjorden. November: *3dje* to Flokke Svaner S. *29de* store Flokke Vildgjæs og Vildænder fra N. *15de* store Flokke Vildgjæs fra N. ind i Fjorden. — J. Nielsen.

Lodbjerg. Maj: *13de* hørtes Gjøgen ved Solnedgang. *15de* Svalen set ved Taarnet om Eftermiddagen. Oktober: *13de* en Flok Krager mod S. *23de* 24 Graagjæs i Flok mod N. — P. S. Pedersen.

Hirtshals. Intet Fuglefald. — H. Hinrichsen.

Højen. Ligeledes. — M. Jørgensen.

Skagen. Usædvanlig faa Fugle ved Fyret iaar. — S. U. Hansen.

Skagens Rev Fyrskib. I Januar kun set Maager og Alke. 18de, 20de, 22de og 23de Februar flere Flokke Lærker V. Marts: *3dje* flere Lærker ved Skibet, og en Krage hvilede der. *7de* enkelte Viber flyvende forbi. Oktober: *22de* flere Krager V. *27de* mange Smaafugle ved Skibet. 16de November flere Flokke Svaner fløj i sydlig Retning. — A. P. Jensen.

Nordre Røn. 13de Marts kom de første Tejster; deres Tal var en Del forøget iaar; der var omtrent 25 Par. 24de Marts kom Gravanden, ligeledes i større Tal end foregaaende Aar, omtr. 40 Par. 3dje August kom de første Ederfugle med Unger fra

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Læsø, og de opholdt sig ved Øen hele Vinteren. I Maanederne September—December iagttoges store Flokke at Knortegjæs, Graaænder, Dykænder, Søpapegøjer og Alke, de tre sidstnævnte Slags endog i Tusindtal. En enkelt Svane opholdt sig ved Øen nogle Dage midt i November. December: *4de* 6 Svaner mod S. V. 2 Svaner opholdt sig V. for Øen i længere Tid. *12te* blev en Lappedykker skudt, en Fugl, der meget sjelden sees her. *13de* 2 Svaner opholdt sig S. V. for Øen. *14de* 2 Krager mod S. V., 2 Svaner S. Ø. *19de* 4 Svaner opholdt sig Ø. for Øen. *25de* 5 Svaner svømmede N. for Øen. *27de* 2 Svaner fra N. Ø. — L. F. Madsen.

Læsø Trindel Fyrskib. Februar: *2den* enkelte mindre Flokke Ederfugle S. V. *6te* en Lærke ombord nogle Timer midt paa Dagen. *18de* en Flok Smaafugle mod Ø. *23de* 8 Svaner N. Ø., en Del Ederfugle og Smaaænder i alle Retninger. Marts: *1ste* 10 Svaner S. *10de* flere store Flokke Krager N. Ø. 13de August en lille Fugl ombord. 29de September en Sule flyvende S. Oktober: *6te* og *10de* flere store Flokke Krager S. V. *12te* og *17de* ligeledes. *25de* flere Flokke Krager S. V. *29de* en Sule, der med Strømmen drev forbi Skibet, fangedes levende; den viste sig at være meget afkræftet og blind, vist af Alderdom, da der ikke fandtes noget Saar paa den; den blev dræbt, efter at den var fodret med Fisk et Par Dage. November: *16de* 4 Svaner N. V. *17de* 4 Svaner S. Ø. 5te December 8 Svaner S. V. — P. V. Eriksen.

Læsø Rende Fyrskib. 23de Februar 40 Svaner mod N. Ø. Oktober: *5te* flere Krager V. *9de* flere Flokke Krager V. *31te* 10 Svaner fra N. mod S. V. November: *7de* 30 Graagjæs fra N. Ø. mod V. *16de* 10 Svaner fra N. Ø. mod V. — P. C. Grumsen.

Østre Flak Fyrskib. 6te Marts mange Krager mod Ø. hele Dagen. 3dje April mange Krager mod Ø. om Morgenen. Oktober: *6te* en stor Flok Krager V. Kl. 5 Em. *7de* mange Krager V. i Løbet af Dagen. 11te November mange Gjæs sete om Morgenen. — C. Knudsen.

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Egense. 31te Januar Stæren set i Haven; en Flok Regnspover ved Iskanten. Februar: *7de* 6 Svaner flyvende V.; enkelte Ænder og andre Svømmefugle sees daglig paa Træk. *19de* Kl. 3½ Em. 4 Svaner Ø.; store Havmaager og en Flok Sommer-Strandmaager sete; Lærkerne synge. 10de April Viber sete. Maj: *10de* den første Svale set. *14de* en Høg viste sig ved Fyret og greb en Stær, men slap den, da Hunden blev pudset efter den, og Stæren søgte Skjul i sin Kasse. 4de August en Flok Regnspover flyvende S. 24de September Flokke af Ænder ude over Farvandet. Oktober: *21de* de første Ederfugle sete i Farvandet; store Flokke af Gjæs. *22de* om Morgenen Flokke af Ænder trækkende Ø. over Limfjorden. November: *11te* Flokke af Svaner dragende i forskjellige Retninger, 8 sete paa Grundene. *12te* Flokke af Gjæs dragende V. op ad Limfjorden, i Modsætning til det sædvanlige Træk, hvor Gjæs og Ænder om Morgenen og Dagen trække mod Ø., mod Søen, og om Natten V. over Land. December: *22de* Sværme af Vildgjæs i Vejdybet. *27de* 5 Svaner Ø. og N.; enkelte Ederfugle i Farvandet. — A. Grove Stephensen.

Udbyhøj. Intet Fuglefald. — H. P. Jensen.

Anholt Knob Fyrskib. Marts: *3dje* en Krage paa Skibet hele Dagen, fløj senere V. *9de* store Flokke Krager fløj Ø. hele Dagen. April: *5te* flere Smaafugle paa Dækket hele Dagen. *6te* flere Bogfinker og en Stær paa Dækket hele Dagen og 2 Stære i Krogene under Dækket. 21de Maj en lille Fugl ved Skibet. 6te September en Aalekrage mod N. V. Oktober: *2den* 3 Rødkjælke og 2 Gjerdesmutter nogle Timer paa Skibet. *5te* en Flok Graagjæs mod V. *29de* 3 Graagjæs mod S. November: *6te* 2 Svaner fra N. mod S. V. *8de* en Flok Gjæs S. *9de* 2 Alke S. V. *10de* 2 Flokke Alke S. V., senere ligeledes flere store Flokke Alke. *11te* en Flok Krager fra Ø. mod S. V. *15de* 3 Flokke Alke S., flere Flokke Ænder mod N. og N. V. *20de* en Flok Krager V. *27de* flere Flokke Ænder N. V. December: *11te* en Flok Ederfugle S. *13de* flere Flokke Ederfugle S. V. — Th. Andresen.

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Spotsbjerg. I 1910 var der saa godt som ingen Fangst af Ænder paa Isefjord. 4de December blev der paa Stranden fundet en død *Alca torda* (indsendt til Museet). — P. Christensen.

Fornæs. 12te Januar fløj 7 Svaner forbi mod S. og mindre Ænder ligeledes i tusindvis. Maj: *1ste* set den første Svale. *22de* 5 Vildgjæs mod N. Ø. 11te Juni 2 Graagjæs kommende fra N. langs Landet lige over Havfladen, fløj derefter mod Ø. 21de September 8 Graagjæs mod S., omtr. 50 Skovskader mod N. V. Oktober: *5te* 3 Skarver S. *12te* 5 Knortegjæs S. *16de* omtr. 40 Ederfugle mod N. November: *11te* 5—6 Flokke Skarver paa 3—4—6 Stkr. mod S. *14de* en Svane S. V. *16de* 8 Svaner S. V. — A. Kruse.

Hjelm. Februar: *1ste* en Skovsneppe set. *12te* en Stær set. *22de* 2 Viber sete. Marts: *6te* Strandskaden kommen. *18de* en Flok Regnspover mod N. — A. P. Jensen.

Æbeltoft Vig. Intet Fuglefald. — H. P. Mønsted.

Sletterhage. Ligeledes. — V. Larsen.

Sejrø. I Januar blev daglig set større Flokke Ederfugle, Havlitter, sorte Ænder og Graaænder svømmende og trækkende omkring Revet; mange af dem bleve skudte fra smaa Pramme. I Februar vare de samme Slags at se undtagen Graaænderne. 13de Marts 3 Gravænder svømmende ved Revet. 21de Maj omtr. 50 graa Gjæs trækkende Ø. 26de August 12 Graagjæs V. 15de Oktober omtr. 35 Aalekrager N. Ø. Sidst i Aaret var der i Nærheden af Fyret utallige Ederfugle og sorte og graa Ænder; daglig skydes en Del; 2 Svaner viste sig og bleve ligeledes skudte. — A. M. Dam.

Nakkehoved. Intet Fuglefald. — W. Schultz.

Lappegrund Fyrskib. Februar: *13de* en Krage og 7 Ederfugle V. *14de* en Flok Smaafugle V. *23de* 3 Krager V. *28de* en Stær Ø. Marts: *11te* 5 Ederfugle V. *12te* en Lærke V. *20de* en Flok Ederfugle S. Ø. *23de* 4 Vildgjæs V. *28de* en Flok Vildgjæs V. 13de Maj 2 Storke Ø. September: *12te* en Mængde „Lærker og Rødkjælke" om Skibet. *22de* en Flok Smaafugle V.

(1910.)

30te ligeledes. 9de Oktober en Flok Vildgjæs V. November: *10de* en Flok Krager V. *29de* en Flok Ænder V. December: *2den* 9 Svaner S. *15de* en Flok Svaner S. V. *22de* flere Flokke Vildænder N. — A. Albertsen, J. C. Jensen.

Kronborg. Intet Fuglefald. — H. Reinwald.

Middelgrund. Intet. — A. G. Saxtorph.

Trekroner. 24de Februar 2 Stære paa Fortet. Flere Stære tog Bo i Stærekasser ophængte i Foraaret. Et Par Vipstjerter ynglede paa Fortet. — H. E. Andresen.

Nordre Røse. Intet Fuglefald. 12te Oktober 2 Flokke Gjæs i Nærheden af Fyret. 10de December 2 Flokke Svaner mod Ø. — J. T. Hansen.

Drogden Fyrskib. 9de Februar 5 Svaner S. V. 4de Marts en Del Bogfinker paa Skibet om Eftermiddagen. December: *4de* en stor Flok Svaner Ø. *18de* 5 Svaner S. — N. J. Kromann.

Refsnæs. I Februar indsendtes en dræbt Bjergand (*Fuligula marila*) ♀ som Prøve paa „Lysand". 3dje Marts blev Viben set første Gang, 10de ligeledes Stæren. 12te April blev første Stork set. Et Par Gravænder rugede i Nærheden af Fyret. I sidste Halvdel af November og første Halvdel af December trak store Flokke Skovduer S. V. — V. Jensen.

Romsø. Januar: Fra *1ste* til *10de* Stære sete paa Marken, Kl. 4 Em. flyvende ind i Skoven. Fra *2den* til *6te* 18 Ederfugle ved Kysten. *7de* en Snes Krager paa Stranden, mod Aften flyvende V. til Fyn. *30te* flere tusinde Stære paa Marken. *31te* flere Flokke Ederfugle S. Februar: *12te* 2—300 Ederfugle ved Kysten; Gravanden kom. *18de* 20 Krager Ø. *24de* omtr. 100 Drosler flyvende fra Skoven til Fyret flere Gange. Marts: Fra *1ste* til *9de* hver Dag mange Krager, Raager og Alliker Ø. *9de* begyndte Maagerne at komme paa Yngleplads, og de samlede sig flere og flere til Maanedens Slutning. Fra *12te* til *28de* hver Dag mange Krager og Alliker, Musevaager og enkelte Høge Ø. April: Fra *7de* til *12te* mindre Flokke Krager, Raager og Alliker Ø. *23de* 8 Graagjæs N. Ø. Maj: *9de* kom Svalen. *12te* 23 Graagjæs

(1910.)

Ø. N. Ø. *19de* 7 Graagjæs Ø. *20de* 40 Ederfugle tæt ved Kysten. *22de* 4 Graagjæs Ø. N. Ø. August: *1ste* rejste Maagerne med deres Yngel; nogle faa, hvis Unger ikke vare flyvefærdige, bleve tilbage til Maanedens Slutning. *16de* 16 Graagjæs V. *26de* 8 Havlitter N. September: Fra *4de* til *8de* hver Dag flere hundrede Stære i Flok i Haven og paa Marken, flyvende fra og til Skoven. *10de* 4 Graagjæs S. V. *18de* 12 Ederfugle S. *21de* 3 Flokke Ederfugle S. *28de* 2 Flokke Graagjæs V., enkelte Krager V. Oktober: Fra *7de* til *11te* hver Dag mange Krager i større og mindre Flokke V. Fra *18de* til *24de* hver Dag flere Flokke Ederfugle S. *30te* 20 Graagjæs V. November: *2den* 10 Krager V. *12te* flere hundrede Alliker V. *16de* mange Ederfugle S. *19de* 6 Graagjæs N. V. *24de* 8 Svaner S. *26de* omtr. 100 Havlitter S. V. *30te* 40 Alliker V. December: *12te* flere Flokke Ederfugle S. og N. *18de* omtr. 200 Drosler kom fra Ø. og trak over Øen mod V. *30te* 4 Stære paa Bygningerne. — F. Andersen.

Halskov og *Korsør.* Intet Fuglefald. — C. P. Henningsen.

Sprogø. 22de Februar store Flokke Stære i Haverne, 2 Viber paa Marken. Marts: *6te* 10 Strandskader paa Stranden. *27de* begyndte Maagerne at bygge Rede; flere hundrede Par vare komne tidligere i Marts. April: *9de* fløj en Stork N. Ø. *16de* saaes de første Æg af Hættemaager, *23de* de første af Stormmaagerne. 16de Maj saaes de første Ællinger af Graaænder, i Reden, og de første Svaler viste sig, 5 Par. Fasaner ere indførte til Øen iaar, en Han og 2 Hunner. Juni: *5te* saaes de første Strandmaage-Unger; Æggene havde været samlede indtil 25de Maj. *25de* vare de første flyvefærdige Maage-Unger at se. 16de Juli fandtes en Graaande-Rede, hvor Ungerne vare ved at bryde gjennem Æggeskallen. August: *3dje* vare kun nogle faa Maager tilbage; *9de* vare alle borte. *31te* store Flokke Stære paa Marken, efter at de havde været borte i nogen Tid. I Slutningen af Oktober kom nogle smaa Flokke Ederfugle; i Løbet af November kom flere større Flokke. 26de November 7 Svaner N. Ved Aarets Slutning

(1910.)

var der næsten ingen Vildænder af nogen Art i Nærheden af Sprogø, maaske paa Grund af det milde Vejr. — A. V. Hansen.

Slipshavn. Intet Fuglefald. — E. Jørgensen.

Helholm. Intet Fuglefald. 21de Februar Stær og Strandskade sete. 8de Marts Graagaas set. — P. Larsen.

Omø. Februar: *14de* 5 Svaner mod N. N. V. *26de* en Aalekrage opholdt sig en kort Tid paa en Søsten udfor Fyret. Marts: *3dje* Viben kommen. *4de* Strandskaden kommen. Maj: *5te* Svalen set. *11te* Gjøgen hørt. 1ste December store Flokke Ederfugle i Stranden. — A. T. Friis.

Taars. Intet Fuglefald. — W. Pedersen.

Strib. Intet Fuglefald. 13de Februar Stæren set. Maj: *14de* mange Flokke Graagjæs trækkende N. *22de* en Flok Graagjæs paa flere hundrede mod N. 2den August flere store Flokke Himmelhunde mod S. om Morgenen. 30te September mange store Flokke Graagjæs mod S. — A. H. Andersen.

Baagø. Intet Fuglefald. — N. Hansen.

Assens. Ligeledes. — N. Lund.

Hammeren. 17de Februar hørtes Lærken synge første Gang. April: *11te* en Flok Gjæs mod N. *17de* en meget stor Flok Gjæs N. *18de* store Flokke Gjæs hørtes trække N. 14de Maj hørtes Gjøgen første Gang. 8de Oktober 7 Svaner V. Et Par Gange i første Halvdel af Oktober blev den Store Tornskade set i Fyrets Have. — E. Wielandt.

Dueodde Sydfyr. 17de Marts 33 Svaner S. Ø. Kl. 10,30 Fm. 12te April omtrent 100 „Svaner med sorte eller graa Vinger“ (Traner?) i Flok trækkende hen over Fyret mod V. N. V. i betydelig Højde. 17de September 26 „Svaner“ kredsede over Fyret, højt, Kl. 10 Fm., samtidig trækkende S. V. 2den November 7 Vildgjæs S. Kl. 10,45 Fm. — H. S. L. Madsen.

Møen. En Del Havlitter opholdt sig i Farvandet ved Fyret i November og December, men ingen andre Ænder. — J. Z. Nielsen.

Harbølle. Intet Fuglefald. — A. J. Olsen.

Hestehoved. Ligeledes. — N. Christensen.

(1910.)

Gjedser Rev Fyrskib. Januar: *6te* 6 „Bogfinker“ opholdt sig ved Skibet hele Dagen. *27de* 24 Svaner S. V. 17de August 50 Storke mod S. S. Ø. 27de September omtr. 10 Graagjæs mod N. V. 18de Oktober 9 Bogfinker og 5 andre Smaafugle ved Skibet hele Dagen. — Th. Hald, J. Jensen.

Usædvanlige Tildragelser i 1910.

Colymbus arcticus.

En Sortstrubet Lom, gammel Hun i Sommerdragt, fanget ved *Sevedø*, S. Ø. for Skjelskør, 27de August, gav Læge J. Chr. E. Christiansen til Zoologisk Museum. En stor Del af Underkjæben havde den mistet; men Saaret syntes lægt.

Procellaria pelagica.

At en Stormsvale, Hun, var dræbt ved *Hanstholm* 30te November, meddeler Konservator H. J. Hansen.

Fulmarus glacialis.

En Stormfugl, Han, blev skudt ved *Krik* ved Vestervig 25de September, meddeler Konserv. H. J. Hansen.

Oedicnemus crepitans.

En Triel, Hun, blev skudt ved *Bøvlingbjerg* S. V. for Lemvig 28de November og som udstoppet skjænket Museet af Konserv. H. J. Hansen. I Mund og Hals fandtes Regnorme, og i Maven havde den en Husmus, en Ørentvist, to Bille-Larver, to Bænkebidere og nogle Fjer.

Sterna caspia.

En Rovterne, Han, blev skudt ved *Nymindegab*, S. V. for Tarm, 2den September, oplyser Konserv. H. J. Hansen. Kun denne ene var set.

Lestris pomatorhina.

En Mellemkjove, ung Han, skudt i *Nissum Bredning* i Limfjorden 29de September, gav Dr. C. G. Joh. Petersen til Museet.

(1910.)

Milvus ictinus.

Glenten er igjen iaar set i *Store Bøgeskov* N. V. for Ringsted af Skovfoged H. Thorsøe.

Upupa epops.

En Hærfugl skudt i en Roe-Mark ved *Snedinge*, S. Ø. for Skjelskør, 30te August, gav Læge J. Chr. E. Christiansen til Museet. Ved *Albøge*, S. V. for Grenaa, blev en skudt 4de November, meddeler Konserv. H. J. Hansen, der ogsaa oplyser, at en Han blev skudt ved *Grindsted*, S. Ø. for Tarm, 26de November.

Parus cristatus.

I de første Dage af August iagttoges Topmejser i Gran og Fyr forskjellige Steder i *Ribe* Plantage, meddeles af Eskil Skovgaard og Halfdan Lange.

Fra Stenalder og uvis Fortid.

Til Fortegnelserne over vore jordfundne Fugle (se Vidensk. Medd. for 1903, S. 61—109, for 1905, S. 222—226, og for 1909, S. 111—113) er noget at føje, deriblandt *Gecinus viridis* fra Stenalderen, en Art der ikke hidtil kjendtes som jordfunden hos os.

De paagjeldende Findesteder og Fund (for Sammenhængens Skyld nævnes ogsaa de andre fundne Hvirveldyr) ere:

Fra Ældre Stenalder.

Lovns, ved Limfjorden, omtrent 2 Mil N. Ø. for Skive. Kjøkkenmødding. Indsamlet i 1905 for Nationalmuseet. Gjennem Direktør Dr. S. Müller skjænket til Zoologisk Museum i 1908.

Cygnus musicus.
Podicipes cristatus.
Larus argentatus.
Meles taxus.
Sus scrofa ferus.
Cervus capreolus.
Cervus elaphus.
*Bos taurus urus (& domesticus).**)

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*) Hvad der snarest er tilfældige Indblandinger, er sat i Klammer.

Sebber, ved Limfjorden, omtrent $^3/_4$ Mil S. V. for Nibe. Skaldynge. Af Nationalmuseet skjænket til Zoologisk Museum i 1910.

Cygnus musicus?
Anser torqvatus.
Tetrao urogallus.
Phalacrocorax carbo.
Felis catus fera.
Canis vulpes.
Canis familiaris.
Cervus capreolus.
Cervus elaphus.
(Bos taurus domest.)
Sus scrofa ferus.
(Homo sapiens.)

Vejleby, ved Isefjord, omtrent $1^1/_2$ Mil N. Ø. for Holbæk. Skaldynge. Af Nationalmuseet skjænket til Zoologisk Museum i 1910.

Angvilla vulgaris.
Gadus morrhua.
Pleuronectes sp.
Scomber scombrus.
(Bufo sp.)
Pagonetta glacialis.
Oedemia fusca.
Somateria mollissima.
Mergus merganser.
Podicipes cristatus.
(Arvicola amphibius.)
(Arvicola agrestis.)
Felis catus fera.
Canis vulpes.
Canis familiaris.
Martes sylvatica.
Cervus capreolus.
Cervus elaphus.
Sus scrofa ferus.

Sølager, paa Nordkysten af Mundingen af Roskilde Fjord, S. V. for Frederiksværk. Skaldynge. Indsamlet af Nationalmuseet i 1907. Skjænket Zoologisk Museum i 1909. Det er den samme Kjøkkenmødding, hvorfra der tidligere foreligger store Fund.

Esox lucius.
Angvilla vulgaris.
Belone rostrata.
Gadus morrhua.
Pleuronectes sp.
Cottus scorpius.
Anas penelops?
Anas boscas.
Cygnus minor.
Cygnus musicus.
Podicipes cristatus.
Colymbus septentrionalis.
Clangula glaucion.
Oedemia nigra.
Oedemia fusca.
Somateria mollissima.

Mergus merganser.
Mergus serrator.
Tetrao urogallus.
Tachybaptes minor.
Larus canus.
Larus argentatus.
Larus marinus.
Uria troile.
Alca impennis.
Plalacrocorax carbo.
Haliaëtus albicilla.
Gecinus viridis.
Corvus cornix?
Fringilla montifringilla?
Erinaceus europæus.
Castor fiber.
Sciurus vulgaris.
Felis catus fera.
Canis vulpes.
Canis familiaris.
Martes sylvatica.
Lutra vulgaris.
Halichoerus grypus.
Cervus capreolus.
Cervus elaphus.
(Ovis aries.)
(Bos taurus domest.)
Sus scrofa ferus.
Phocæna communis.
(Homo sapiens.)

Fra Yngre Stenalder.

Troldebjerg, ved og i Gammellungs Mose ved Illebølle, S. Ø. for Rudkjøbing. Kjøkkenmødding. Indsamlet af Hr. J. Winther og af ham skjænket til Zoologisk Museum i 1906 og 1908.

Emys orbicularis.
Cygnus sp.
Somateria mollissima.
Phalacrocorax carbo.
Castor fiber.
Canis familiaris.
Lutra vulgaris.
Cervus elaphus.
Ovis aries.
Capra hircus.
Bos taurus domest.
Sus scrofa domest.
(Eqvus caballus.)
(Homo sapiens.)

Fra uvis Fortid.

Ørting Mose, S. for Odder. Skjænket til Zoologisk Museum af Lærer M. P. Madsen i 1909.

Grus cinerea.

Hollerup, omtrent $1^3/_4$ Mil S. Ø. for Randers, paa Nordsiden af Gudenaa-Dalen. Vistnok Fyld fra en gammel Rævegrav, der i uvis Fortid er gravet i en interglacial Aflejring. Af Dr. N. Hartz i 1907 indsendt til Bestemmelse.

Batrachia.
Tetrao urogallus.
Hypudæus glareola.

Svinø, omtrent $1^1/_2$ Mil. S. for Næstved. Fundet i en Jættestue, vist for største Delen Indholdet af et gammelt Ræve-Bo; flere af Knoglerne ere gnavede af Rovdyr. Af Nationalmuseet skjænket til Zoologisk Museum i 1910.

Anas boscas.
Mergus merganser.
Canis vulpes?
Phoca vitulina.
Cervus capreolus.
Cervus elaphus.
Bos taurus domest.

Troldhøj, ved Stenstrup omtrent en Mil V. for Nykjøbing paa Sjælland. Fundet i en dobbelt Jættestue, vist for største Delen, til forskjellig Tid, indslæbt af Rovdyr, snarest af Maare. Af Nationalmuseet skjænket til Zoologisk Museum i 1910.

Bufo sp.
Anas boscas.
Gallus ferrugineus.
Grus cinerea.
Astur palumbarius.
Corvus corax.
Lepus europæus.
Arvicola amphibius.
Felis catus, domest?
Meles taxus?
Cervus capreolus.
Cervus elaphus.
Ovis aries.
Bos taurus domest.
Sus scrofa.
Eqvus caballus.

Søhjem Mose, i den vestlige Del af Øster-Marie Sogn. Bornholm. Fundet paa Grændsen mellem Tørven og den underliggende Gytje. Givet til Zoologisk Museum af Dr. N. Hartz i 1911.

Phalacrocorax carbo.
Sus scrofa ferus.

De fundne Fugle-Knogler ere:

Anas penelops? Pibeand?

Sølager. Nedre Del af en Overarm. Kunde muligvis forvexles med *Anas acuta* og *A. strepera*.

Anas boscas. Stokand.

Sølager. Nedre Ender af 2 Skulderblade, forreste Ender af 2 Brystben, øvre Ende af en Overarm, et næsten helt Albueben. Svinø. En Overarm, et Albueben. Troldhøj. Adskillige Knogler, de fleste vistnok sammenhørende. Knoglerne fra de to sidstnævnte Steder ere maaske af tamme Ænder.

Cygnus minor. Pibesvane.

Sølager. Midtstykke af et Albueben, Midtstykke af et Skinneben.

Cygnus musicus. Sangsvane.

Lovns. 2 Ravnenæbsben. Sebber. Art tvivlsom, Mulighed for Forvexling med *C. olor.* Nedre Ende af et Skulderblad, nedre Ende af et Laarben, 2 Taaled. Sølager. 2 Stykker af Underkjæbe-Grene, 3 Halshvirvler, nedre Ende af et Skulderblad; 6 Stykker af Ravnenæbsben, deriblandt 3 øvre Ender; 5 Stykker af Nøgleben, forreste Ende af et Brystben; 11 Stykker af Overarme, deriblandt Dele af mindst 5 øvre Ender og 2 nedre Ender, af hvilke den ene er helt vanskabt, vistnok som Følge af et Saar; 8 større eller mindre Stykker af Midten af Spoleben, 6 Stykker af Albueben, en Haandrodsknogle, Midtstykker af 2 Laarben og 1 Mellemfod. De fleste af Knoglerne kunne ikke med Sikkerhed skjelnes fra Knogler af *C. olor*; men Ravnenæbsbenene og Brystbenet ere afgjort af *C. musicus.* Troldebjerg. Arten usikker. Stump af nedre Ende af en Overarm.

Clangula glaucion. Hvinand.

Sølager. Bageste Del af en Underkjæbe, 8 Skulderblade; 36 Ravnenæbsben, mere eller mindre mangelfulde; forreste Ender af 6 Brystben; 17 Overarme, af hvilke 4 næsten hele; 11 Albueben, deraf 1 næsten helt; 4 Mellemhaandsben; 9 Laarben, mest Midtstykker; 11 Stykker af Skinneben. Mulig, men ikke sandsynlig, ere nogle af de største af de Ravnenæbsben, der her ere henførte til *Clangula glaucion*, forvexlede med Knogler af *Fuligula marila*; det har vist sig, ved rigeligere Sammenlignings-Stof, at

Ravnenæbsben af Hanner af *Clangula glaucion* og Hunner af *Fuligula marila* kunne være saa ens, at de neppe ere til at skjelne, især ikke i ufuldstændig Tilstand; de Ravnenæbsben, der i Vidensk. Medd. for 1903, S. 83, ere nævnte fra Skaldyngerne ved Mejlgaard, Klintesø, Havelse, Sølager og Sejrø og henførte til *Fuligula marila*, maa derfor regnes for tvivlsomme; de, der ere opførte fra Havnø, ere derimod sikre.

Pagonetta glacialis. Havlit.

Vejleby. En Overarm, uden Led-Ender.

Oedemia nigra. Sortand.

Sølager. 9 Ravnenæbsben; nogle af de største ere dog maaske forvexlede med Knogler af Hunner af *Oedemia fusca*. I den store Mængde af ubestemmelige Knogle-Brudstykker af Andefugle af Middelstørrelse foreligge vistnok andre Knogler af Sortanden.

Oedemia fusca. Fløjlsand.

Vejleby. Midtstykke af en Mellemfod. Sølager. 5 nedre Ender af Skulderblade, 14 Ravnenæbsben, 5 forreste Ender af Brystben, 4 Midtstykker af Overarme, 8 Midtstykker af Albueben, øvre Ende af en Mellemhaand, 5 Midtstykker af Laarben, et Midtstykke og en nedre Ende af Mellemfod.

Somateria mollissima. Ederfugl.

Vejleby. Nedre Ende af et Skulderblad, Stykker af 2 uens Overarme. Sølager. 2 Sæt Bækkenhvirvler, 3 nedre Ender af Skulderblade, 5 Stykker af Nøgleben, 7 Ravnenæbsben, 5 forreste Ender af Brystben, Midtstykker af 9 Overarme og 5 Albueben, Stykker af 2 Mellemhænder, Midtstykker af 6 Laarben, Stykker af 6 Skinneben. Troldebjerg. Nedre Ende af et Albueben.

Mergus merganser. Stor Skallesluger.

Vejleby. Bageste Del af en Underkjæbe, øvre Ende af et Ravnenæbsben. Sølager. 6 Ravnenæbsben, Stykker af 2 Laarben. Svinø. Stykke af en Hjernekasse. En Klump knuste smaa Fiske-Knogler, der fandtes samme Sted, er sandsynligvis Mave-Indhold af Skalleslugeren.

Mergus serrator. Toppet Skallesluger.

Sølager. Flere Stykker af nedre Strubehoved, 11 Ravnenæbsben, 3 forreste Ender af Brystben; 7 Stykker af Overarme, mest Midtstykker; 4 Mellemhaandsben, 3 Midtstykker af Laarben, et næsten helt Skinneben.

Anser torqvatus. Knortegaas.

Sebber. Et Ravnenæbsben, et Skulderblad.

Tetrao urogallus. Tjur.

Sebber. Midtstykker af Overarm og Albueben, Stykke af en Mellemhaand. Sølager. Midtstykke af Overarm af Han, øvre Ende af Skinneben og øvre Ende af Mellemfod af Hun. Holerup. Spoleben og Mellemhaand af Han, begge hele.

Tachybaptes minor. Lille Lappedykker.

Sølager. 4 Midtstykker af Overarme, Midtstykke af et Albueben, et næsten helt Laarben, nedre Ende af et Skinneben.

Podicipes cristatus. Stor Lappedykker.

Lovns. 2 Mellemfodsben. Vejleby. Midtstykke af en Underkjæbe-Gren, et Ravnenæbsben uden nedre Ende, Midtstykke af en Overarm, Stump af et Albueben, Midtstykke af et Laarben, Midtstykke af en Mellemfod. Sølager. 2 Skulderblade, 3 Ravnenæbsben, Midtstykker af 1 Overarm, 2 Albueben og 2 Laarben, Stykker af 3 Skinneben, 1 helt Mellemfodsben og Stykker af 7 andre.

Colymbus septentrionalis. Rødstrubet Lom.

Sølager. Nedre Ende af et Skulderblad.

Grus cinerea. Trane.

Ørting Mose. Skinneben og Mellemfod. Troldhøj. Et udspaltet og tilspidset Stykke af et Skinneben, tildannet som Redskab i Yngre Stenalder.

Larus canus. Stormmaage.

Sølager. Midtstykke af en Overarm.

Larus argentatus. Havmaage.

Lovns. Stykker af 2 Overarme, Midtstykke af et Laarben. Sølager. Et Ravnenæbsben, Stykke af et Albueben.

Larus marinus. Svartbag.

Sølager. Stump af et Ravnenæbsben, Midtstykke af et Albueben.

Uria troile. Lomvie.

Sølager. Midtstykke af en Overarm.

Alca impennis. Gejrfugl.

Sølager. Et Sæt Bækkenhvirvler, Midtstykke af en højre Overarm, Midtstykke af et højre Laarben.

Til Fortegnelsen over Gejrfugle-Fundene fra vore Nabolande ere fremdeles (se Vidensk. Medd. for 1909, S. 113) følgende at føje, alle bestemte af H. Winge: Paa en Stenalder-Boplads i Valseshulen nær Christiansund paa Norges Vestkyst S. V. for Trondhjem er fundet et højre Skulderblad, med Snitmærker; sammen med andre Dyre-Knogler indsendtes det fra Trondhjems Museums Oldsagsamling af Overlærer K. Rygh til Bestemmelse; hele Fundet er skildret af A. Nummedal i: Dalehelleren og Valseshulen, to Stenalders Bopladser ved Kristiansund, Kgl. Norske Videnskabers Selskabs Skrifter 1910, Nr. 11, Trondhjem, 1911. Paa en forhistorisk Boplads i Hestneshulen paa Øen Hitteren V. for Trondhjem, snarest fra Stenalderen, er kommet for Dagen bageste Del af en venstre Underkjæbe, Midtstykke af et Skinneben og nedre Ende af et andet, begge højre; Fundet i dets Helhed er skildret af Th. Petersen i: Hestneshulen, Beretning om Undersøkelsen av en forhistorisk Boplads paa Hitteren, Kgl. Norske Videnskapers Selskaps Skrifter 1910, No. 2, Trondhjem. Paa en Jernalder-Boplads paa Kjelmø i Mundingen af Bøkfjorden, ved Sydkysten af Varanger Fjord, fandtes en hel venstre Overarm og et venstre Skinneben uden øvre Ende; det samlede Fund er skildret af O. Solberg i: Eisenzeitfunde aus Ostfinmarken, Christiania Videnskabs-Selsk. Skrifter, II, Hist.-Filos. Klasse, 1909, No. 7. I en Aflejring ved Kolla-

fjarðarnes paa Islands Nordkyst, vistnok væsenligst Indholdet af gamle Rævegrave, er fundet et Stykke af en Pande, forreste Ende af en Underkjæbe, en højre Overarm uden nedre Ende, Midtstykke af et højre Skinneben; hele Fundet er skildret af Guðmundur Bárðarson i hans Afhandling: Mærker efter Klima- og Niveauforandringer ved Húnaflói i Nord-Island, Vidensk. Medd. for 1910; Knoglerne ere skjænkede til Zoologisk Museum.

Phalacrocorax carbo. Skarv.

Sebber. Forreste Ende af et Brystben. Sølager. Midtstykke af et Albueben, Stykke af en Mellemhaand, Midtstykke af en Mellemfod. Troldebjerg. Nedre Ende af et Skinneben. Søhjem Mose. Et helt Albueben.

Haliaëtus albicilla. Havørn.

Sølager. Midtstykke af en Mellemfod.

Astur palumbarius. Duehøg.

Troldhøj. Et Kloled.

Gecinus viridis. Grønspet.

Sølager. Et helt Mellemfodsben, i Form og Størrelse ganske som hos en Grønspet fra Nutiden.

Corvus cornix? Krage?

Sølager. En næsten hel Overarm af en ung Fugl. Kan forvexles med *C. frugilegus.*

Corvus corax. Ravn.

Troldhøj. En Ryghvirvel, et Bækken, Stykker af højre og venstre Laarben.

Fringilla montifringilla? Kvæker?

Sølager. En hel Overarm, i Form og Størrelse ganske som hos *F. montifringilla* Hun fra Nutiden, mindre end hos *F. coelebs,* men Forskjellen saa lille, at en Forvexling maaske er mulig.

(1910.)

Fra Færøerne.

Tveraa og *Galgatange* Fyr. Intet Fuglefald. — E. B. Jacobsen.

Nolsø Fyr. 9de Januar, 2 Suler V. Suler vare derefter at se omtrent hver Dag, sidste Gang 5te December. Marts: *3dje* en Strandskade trak forbi; den næste blev set den 5te; fuldtallig var den ikke før sidst i Maaneden. *4de* flere Viber ved Fyret; derefter vare Viber at se hver Dag til henimod Midten af September. *17de* en Mallemuk faldt (ikke indsendt). *31te* en Lunde trak forbi mod S; ingen blev set igjen før 16de April, Arten var da fuldtallig paa Yngleplads. 14de Oktober en Skraape faldt (ikke indsendt). 22de December en Lunde set. — V. Larsen.

Tofte. Intet Fuglefald. — S. Thorkildshøj.

Kalsø. Ligeledes. — J. Clementsen.

Myggenæs. 12te Marts en Snespurv faldt (*Emberiza nivalis* ♀ Vinger og Fødder indsendte). — D. Olsen.

1.—7.—1911.

Mydæa anomala Jaenn., a parasite of South-American birds.

By

Dr. ***J. C. Nielsen.***

I.

In a collection of various zoological objects, which the Zoological Museum in Copenhagen received in 1910 from Mr. I. Mogensen, a Dane now established in Concepcion, Argentina, there was a finch, *Spermophila gutturalis*, bearing on the belly near the anus a great tumor, the top of which was open, showing a dipterous maggot; the bird was shot on the nest, which contained two eggs.

In addition to this bird the collection also comprised several maggots squeezed out from tumors on nestlings of *Agelaus thilius*, a puparium and a fly bred from such maggots.

On my demand Mr. Mogensen collected in the following months, December 1910 — January 1911, more material. He succeded in finding tumors on nestlings of *Homorus lophotes* and *Pitangus sulfuratus bolivianus* and he observed in the nest of a thrush, *Mimus modulator*, two nestlings, which were both strongly infested with maggots (Fig. 2), and such were also found in the vicinity of the anus of the female bird. He also reared the fly, which proved to belong to the species: *Mydæa anomala* Jaenn[1]).

[1]) F. Jaennicke: Neue exotische Dipteren (Abhandl. herausgeg. v. d. Senckenbergischen naturf. Gesellschaft VI, 1866—67 pag. 377). *Mesembrina anomala.*

From the observations of Mr. Mogensen it appears that the maggots attack both nestlings and elder birds. The fly seems not to be rare and to cause severe damage among the birds. The infested nestlings are killed by the maggots, which leave the tumors after the death of the bird and pupate in the ground. Already 5—6 days after the pupation the flies emerge. I do not know, whether the presense of the maggots also causes the death of the elder birds; the above mentioned *Spermophila gutturalis* appeared to be in good health. Yet it may be that the presense of more maggots in a bird will prove fatal to it.

Fig. 1. *Spermophila gutturalis*.
R. H. Stamm phot.

Fig. 1 represents the above mentioned *Spermophila gutturalis*; the plumes have been removed in front and from the sides of the tumor, but the tumor itself was quite bare. The length and breadth are almost equal, measuring about 9 mm, and the diameter of its opening ca. 7 mm; the tumor contained two larvæ, which were almost fullgrown. While this bird was infested with these two maggots only, the nestlings of *Mimus modulator* were much more infested. The length of the nestlings was ca. 9 cm and on both were found more than a score of maggots, measuring from $1^1/_2$—15 mm Fig. 2.

The larvæ were situated on all parts of the nestlings, also on the head, the wings and the legs.

I suppose that the eggs or more presumably — as I have never seen eggshells on the skin of the birds — the larvæ are deposited by the fly on the birds. The larvæ subsequently excavate a hole in the skin of the birds. Some larvæ have the anal end projecting from the tumor and on such larvæ are found distinct impressions corresponding to the border of the opening of the tumor [1]). The hole, in which the parasite lies, is excavated in the corium. The wall of the tumor (Fig. 3) is very thin; the average

Fig. 2. Two nestlings of *Mimus modulator*. R. H. Stamm phot.

thickness being 0,2 mm, only the border of the opening is somewhat thicker, measuring about 0,4 mm. The border is formed by a coarse layer of strongly compressed and shrivelled cells (a), which also continues a little along the inner side of the wall. The outer side of the wall is lined by an epithelium (b) which becomes rather thick near the opening, whereas it is thinner towards the base of the tumor. Under the epithelium is found a layer of connective tissue (c) enclosing some little blood vessels; the tissue is infiltrated with a great number of leucocytes, which are especially

[1]) In fig. 2 some larvæ are seen protruding much more, f. i. on the heads; this is due to the preservation.

numerous around the vessels and along the inner surface of the wall, which is, of course, not lined by epithelium.

No trace of matter is seen in the tumor and also the excrements and cast larval skins of the parasites are removed from it. The food of the parasite consists of the blood of the tissues along the inner surface of the tumor. As will be shown further on, the mouth of the maggots is provided with spines especially adapted to irritate the tissues, and to form channels along which the blood runs into the mouth opening.

Fig. 3. Longitudinal section of the end of the wall of the tumor on the bird represented in Fig. 1.

II.

By an examination of the skin of the nestlings of *Mimus modulator* I succeded in finding, besides numerous fully grown larvæ, also some younger ones both in the first and the second stages. Thus I have had the opportunity of studying the changes, which the larvæ undergo during the metamorphosis and to compare these changes with those of the larvæ of other Muscidæ.

I a previous paper[1]) I have established general characters taken from the pharyngeal skeleton and the spiracles in order to discriminate the 3 stages of the larvæ of some species belonging

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[1]) J. C. Nielsen: Iagttagelser over entoparasitiske Muscidelarver hos Arthropoder. København 1909.

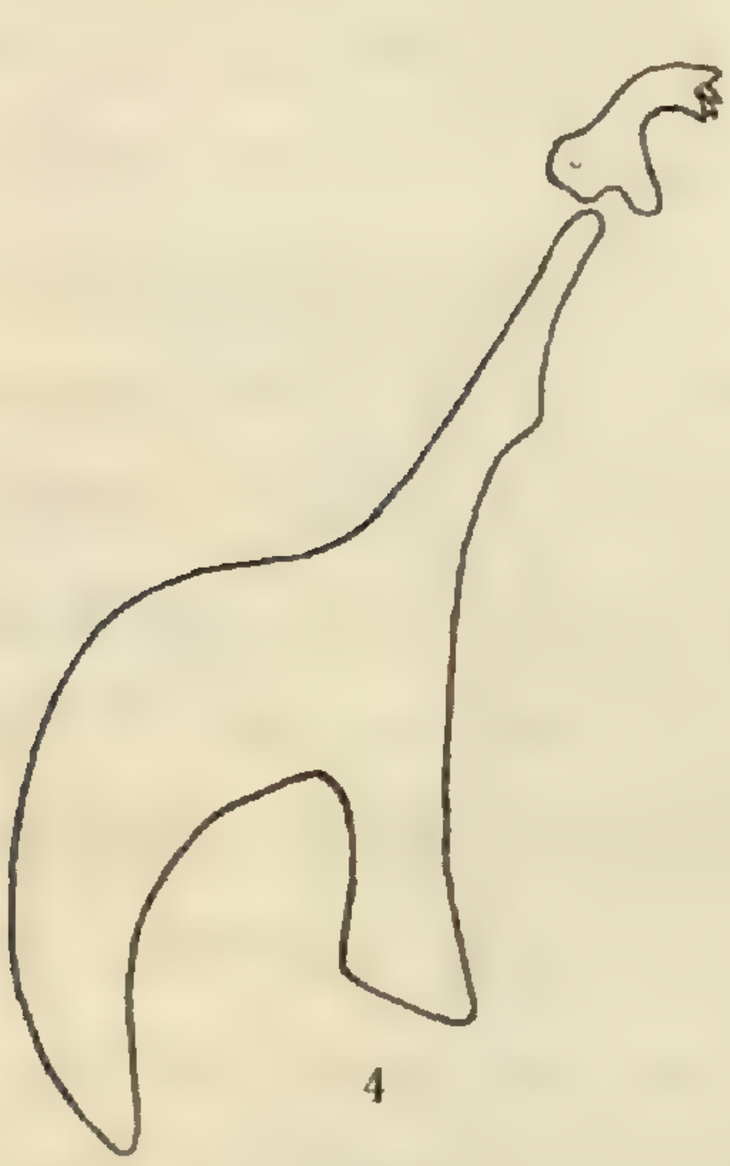
to the *Tachininæ* and *Dexiinæ*, and these characters I have found confirmed by my subsequent studies on other larvæ of the named groups. In order to facilitate the comparison with the larva of *Mydæa anomala* I shall here recapitulate these characters. In the first stage the pharyngeal skeleton is undivided, it terminates in front in a single pointed tooth, on each side of which is found a little hook, which is not connected with the skeleton by an articulation. Only the anal stigmata are present. In the second stage the median tooth of the pharyngeal skeleton has disappeared, each lateral part of the pharyngeal skeleton has in front an articulation to which the mouth-hooks are articulated. Most species are amfipneustic, some few metapneustic and the anal spiracles have only two knobs. In the third stage the anterior part of the pharyngeal skeleton is connected with the posterior by an articulation. Most species are amfipneustic; the posterior spiracles are surrounded by a chitinous border and have at least three knobs.

The larva of *Mydæa anomala* which species is, indeed, systematically rather distant from the *Tachininæ* and the *Dexiinæ* does not agree with the above characters.

In the first stage there is no median tooth and the two lateral parts of the skeleton are separated from each other being only connected by means of a ventral bar; also the mouth hooks are articulated to the skeleton. In both the second and the third stages the skeleton has the same shape as in the 3. stage in the *Tachininæ* and *Dexiinæ* viz: the hooks being articulated with the anterior part of the skeleton and this part with the posterior. A distinctive mark between the two stages therefore cannot be found in the shape of the pharyngeal skeleton. The differences with respect to the shape of the mouth-hooks of *Mydæa anomala* are certainly due to the parasitism of the larva and therefore not suitable to afford general characters.

Also with respect to the spiracles the larva of *Mydæa anomala* is different from those of the *Tachininæ* and *Dexiinæ* having three knobs in the anal stigmata of the second stage.

The mouth armature of the larva of *Mydæa anomala* is very interesting on account of its pronounced adaption to the biology of the larva. In the first stage, in which the larva penetrates through the integument of the host, the two mouth hooks form a bore with sharp teeths placed eminently well for the purpose of producing



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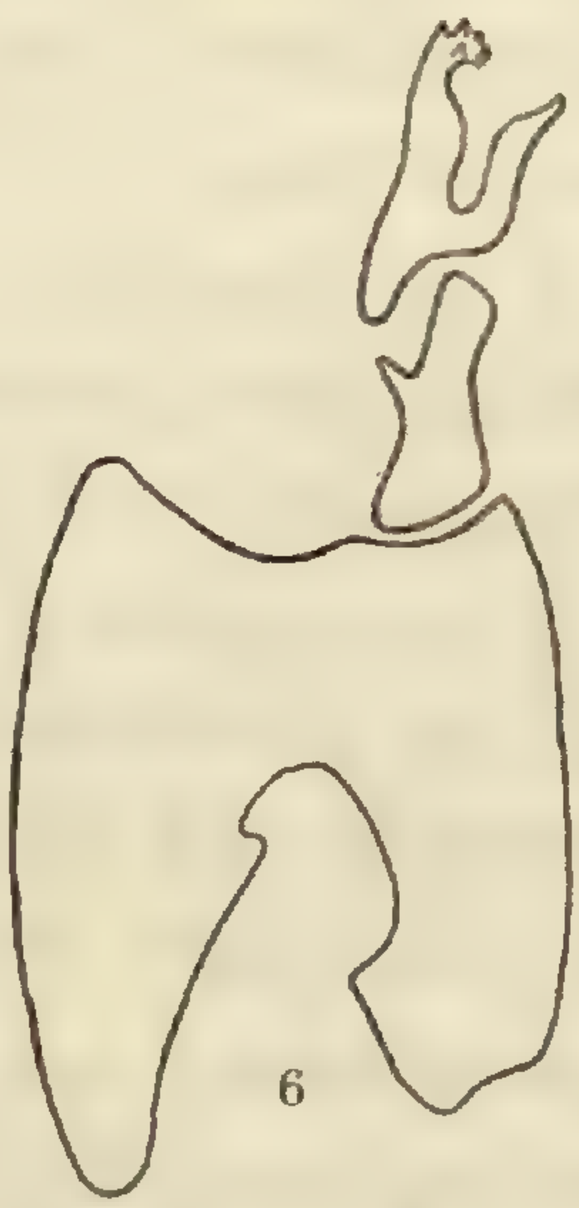

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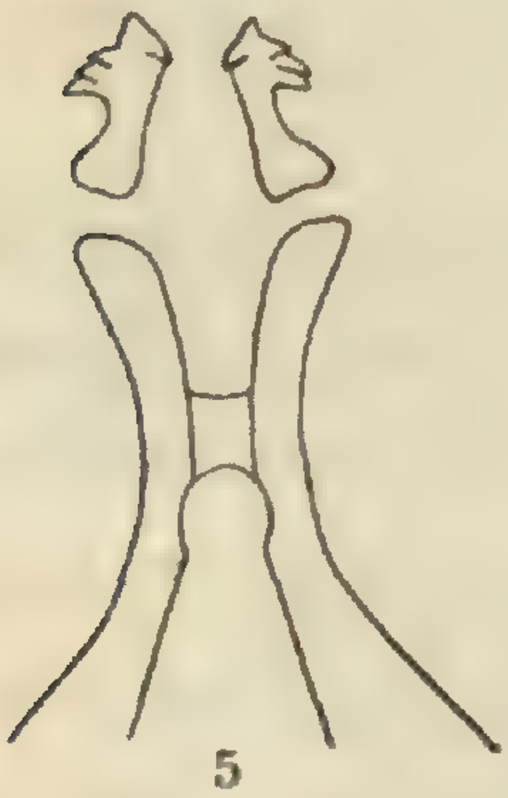

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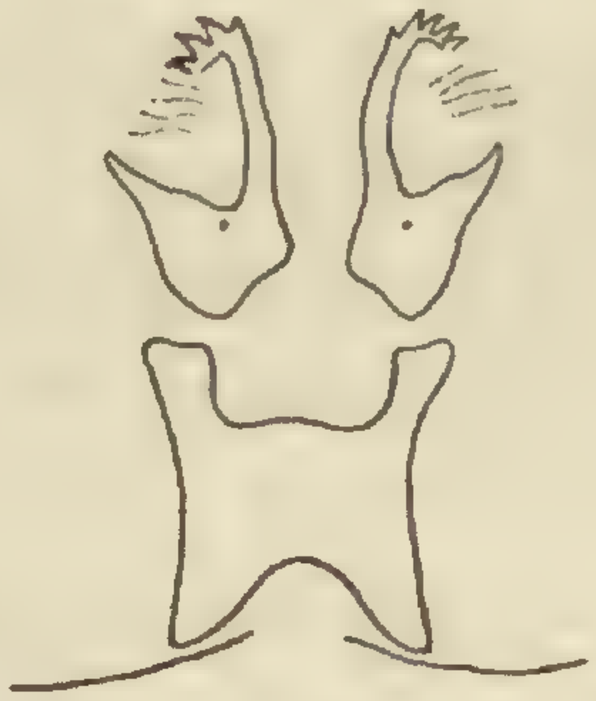

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Figs. 4—9. Mouth hooks and pharyngeal skeletons of the larva of *Mydæa anomala* Jaenn. Figs. 4—5 1' stage; the whole skeleton from the side and the anterior part from beneath; Figs. 6—7 2' stage, Figs. 8—9 3' stage.

a hole. In the second stage, in which the larva is resting on its place in the tumor and in which it feeds on the blood of the host, the mouth hooks have changed into an instrument to irritate the wound, which forms the inner surface of the tumor. The dilatated end of the hooks are provided with strong spines and a prolonga-

tion at the bases of the hooks serves as support for an area of the integument, which is provided with rows of minute spines; the spaces between the rows form a kind of channels along which the food runs to the mouth. In the third stage the shape of the mouth-hooks are not different from those of the larvæ of other Muscidæ, but the integument on each side of the mouth opening is provided with some strong spines, and as in the second stage with rows of minute spines [1]).

In the following I shall give a more full description of the larva. The shape is the usual maggot-like, tapering from behind towards the head; the number of segments is 12, corresponding with the number I have found also in the cases of other Muscidæ.

First stage: The larvæ examined in this stage measured from 1,5—1,75 mm; they were not quite newly hatched, as they had almost penetrated into the skin of the bird. The segments, except the head, are provided with spines, which are spread over the whole of the segments, a little more numerous on the dorsal than on the ventral side, which is especially the case on the last segments. The spines are pointing backwards with exception of those on the posterior margins of the segments 5—11, which are pointing forwards, and this is also the case with the spines on the 12th segment. The head is forwardly produced into two lobes, each bearing at the top a pointed optical tubercle which is almost 3 times longer than broad; at the side of the tubercle is found a short sensory hair and on the ventral side some few minute sensory facettes. The mouth hooks have a broad base; the end is provided with a sharp tooth, under which are found four other teeth; the hooks

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[1]) In the larva of *Exorista blepharipoda* B. & B. I have formerly found a similar mouth-armature: in the second stage the end of the mouth-hooks is divided into a number of pointed teeths and on the side of the mouth opening is found both in the second and the third stages some sharp spines (J. C. Nielsen: Undersøgelser over entoparasitiske Muscidelarver hos Arthropoder. — Vid. Medd. Naturh. Forening København, Bd. 63, 1911, pag. 1).

articulate with the pharyngeal skeleton, which is formed by two lateral plates, connected with a ventral bar; the plates are anteriorly narrow and become broader posteriorly; at the end they are deeply incised. The larva is metapneustic and the posterior spiracles are situated in the hind margin of the anal segment; the atrium is long, somewhat clavate and ending with two knobs.

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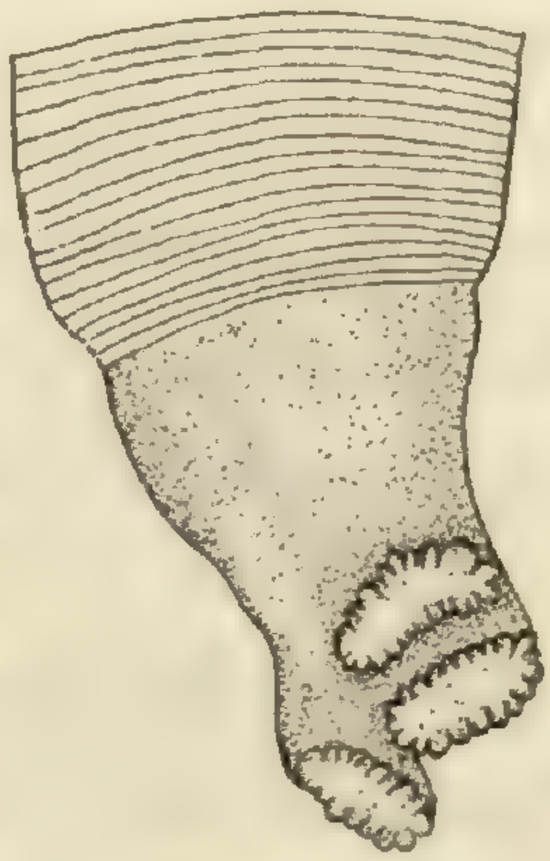

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Figs. 10—14. Spiracles of the larva af *Mydæa anomala*. Fig. 10. 1' stage. posterior spiracle. Figs. 11—12. 2' stage. anterior and posterior spiracles. Figs. 13—14. 3' stage. anterior and posterior spiracles.

Second stage: In this stage the spines are less numerous; the segments 2—4 have spines only on the anterior border but on the following segments also the posterior margins are provided with spines and the 12th segment bears spines on the whole surface. The direction of the spines is the same as in the first stage.

The sense organs of the head have been somewhat altered; the conical optical tubercle is shorter than in the first stage, being not longer than broad, and the sense facettes are now situated on the flattened top of a little papilla.

The mouth-hooks have a rather curious shape. They are split up into two branches; at the end the dorsal branch is dilatated and here provided with a number of spines; the ventral branch is somewhat ventrally curved. Between the two branches the integument carries some rows of very small spines, whose bases are connected. The anterior part of the pharyngeal skeleton is separated from the posterior by an articulation; it consists of two lateral plates, connected by a ventral bar; on the upper side of the plates is found a strong tooth; the posterior part of the skeleton also consists of two plates, which are broad and deeply incised at the end. The anterior spiracles are found intersegmentally between the second and third segment; the atrium is long; the end is fan-shaped, terminating with five knobs; the atrium of the posterior spiracles bears three oblong knobs.

Third stage: The length of the full-grown larvæ was ca. 15 mm. The posterior end is obliquely truncate, in the middle deeply excavated, carrying the posterior spiracles in the centre of the excavation. The sense organs of the head are similar to those of the second stage. On each side of the mouth-opening is found a group of some few strong spines and behind these some rows of minute spines. The mouth-hooks articulate posteriorly with the anterior pharyngeal sclerite, which is formed, as in the 2. stage, by two lateral plates, each provided with a strong spine on the upper side; the plates are connected by a somewhat prominent ventral bar; the posterior end of the sclerites articulates with the posterior pharyngeal sclerites.

The anterior border of segments 2—4 is provided with rows of spines. On the ventral side of the segments 5—11 there is a spiniferous pad, behind which occur some smaller transverse pads, and on the side of the segments are found some minute warty tu-

bercles; similar tubercles also occur on the dorsal side of the segments, being distinct only on the 10—11th segments. The anterior and posterior border of 5—11th segments are provided with spines and the whole 12th segment bears spines, which are situated in short arched rows. The anus lies on the ventral side of the last segment.

The anterior spiracles are found on the posterior margin of the 2. segment; the atrium is conical, somewhat curved and terminates with 4 papilliform knobs. The posterior spiracles are surrounded with a broad chitinous frame enclosing 3 areas, which are filled up by the branches of the atrium; the respiratory areas are sinuated.

The puparium: Length ca. 9 mm, brown, regularly ovate, somewhat more flattened on the ventral than on the dorsal side; the surface is smooth, only the hind end, which is deeply excavated in the centre, is strongly rugose; the anterior spiracles are not prominent and no trace of the pupa spiracles could be observed.

The fly: Male. The head short, frons not prominent: eyes not touching; the narrow vertical triangle reddish brown, continuing as a narrow stripe down into the yellowish brown frontal triangle; the sides of the frons and the cheeks silverwhite; the frontal bristles of same length, black; the jowls silvery in front, yellowish backwards and here clothed with yellow hairs. The bristles at the oral aperture black, the foremost long and thick, more than twice as long as the others. Antennæ bright reddish yellow, the third joint about twice as long as the second; arista long feathered, dark brown, yellow at the base. Palpi yellow. Thorax slate grey with four dark grey stripes, the two median a little diverging backwards and here abbreviated, the lateral interrupted at the transverse furrow, each forming two more or less cuneiform spots. The humeral callus somewhat yellowish. The disc uniformly clothed with short black hairs. Only two acrostichal bristles just in front of the scutellum; two anterior and four posterior dorsocentral bristles; three humeral bristles, one post-

(infra)-humeral bristle, two notopleural bristles; the præsutural bristle standing lower than the posthumeral; one intraalar bristle; three supraalar and two postalar bristles. Pleura grey with some indefinite yellowish markings.

Scutellum with eight marginal bristles. Abdomen darker than thorax, blackish grey, somewhat shining, second segment pale yellowish with only a narrow hind margin dark, third segment with the anterior half yellow, both segments with the middle stripe dark; seen from behind the abdomen is whitishgrey pruinose; venter similarly coloured. Legs yellow, tarsi brownish, black at the end. Front femora with a dorsal, posterodorsal and posteroventral row of long fine bristles, middle femora mainly short-haired, hind femora with an anterodorsal and anteroventral row of short, but rather strong bristles, and with some similar bristles on the anterior side in the middle; front tibiæ short-haired, only with apical bristles, middle tibiæ with two short posterior bristles and strong apical bristles, hind tibiæ curved, with three to four anterodorsal bristles. Wings hyaline, middle cross-vein narrowly seamed, posterior cross-vein S-like curved.

Female. Front and vertex broader than in the male, but however not broad; the middle stripe brown, the sides silvery as in the male. The legs much darker than in the male, the femora blackish grey, only reddish below towards the apex, the tibiæ brownish, tarsi black. To judge from my somewhat damaged female specimen the abdomen has no or indistinct yellowish markings. Length 7—8 mm.

III.

I have only succeded in finding a few litterary records of dipterous larvæ parasitic on birds. In Europe the larvæ of *Protocalliphora azurea* Fall. (*Lucilia dispar* Léon Dufour) are said [1])

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[1]) Brauer & Bergenstamm: Die Zweiflügler des kais. Mus. zu Wien (Denkschr. d. mathem.-naturwiss. Cl. d. kais. Akad. LXI. 1894 pag. 10). —

to occur under the skin of *Anthus pratensis*, *Passer domesticus* and swallows, and it is rather probable, that there are other flies, whose larvæ have similar habits; thus a maggot found under the skin of a young sparrow and described by Kirsch[1]) does not agree with the description of the larva of *Protocalliphora azurea* by Dufour[2]). Outside Europe such parasitic larvæ are only known from the Antillæ and from South-America. In 1854 Macquard[3]) described under the name of *Aricia pici* a fly, which Sallé had bred from a maggot, squeezed out from a tumor on a *Picus striatus* from St. Domingo; the autor adds, that Sallé had seen similar tumors in Mexico on other birds (*Icterus*) and on squirrels. Later on Loew[4]) described the same fly from Cuba as *Hylemyia angustifrons* n. sp. (cfr. Aldrichs catalogue). This fly resembles to a high degree the species treated in this paper, but as the descriptions are rather short it is not to decide with certainty, whether *Mydæa anomala* is identical with it.

In a series of essays on various parasitic Muscidæ R. Blanchard[5]) also mentions and figures a specimen of a parasitic fly, whose larva was found in a wound on the head of a bird (*Oriolus cayennensis*) in Guyana and in the same paper the author also shortly records another somewhat greater maggot from the head of *Oriolus mexicanus*. Blanchard is inclined to adopt the specific identity of the bred fly with *Aricia pici* of Macquard notwithstanding some differences especially in the colour of the abdomen, but the late Austrian dipterist Fr. Brauer identified it with *Mesembrina anomala Jaennicke*, whose type is found in the

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[1]) Th. Kirsch: Ueber zwei Fliegenlarven aus dem Nacken eines jungen Sperlings. (Berliner entomol. Zeitschr. 11. Jahrg. 1867 pag. 245).

[2]) Léon Dufour: Histoires des métamorphoses de la Lucilia dispar (Ann. d. la Soc. entom. de France 2. Sér. III. 1845 pag. 205).

[3]) Macquard: Notice sur une nouvelle espèce d'Aricia (Ann. d. la Soc. entom. de France 3. Sér. I. 1853 pag. 655).

[4]) Loew: Diptera aliquot in insula Cuba collecta (Wiener entom. Monatschrift V. 1861 pag. 9).

[5]) R. Blanchard: Contributions à l'étude des Diptères parasites (Troisième série. Ann. Soc. Entom. Fr. LXV 1896 pag. 652).

collection von Heyden now in the possession of the museum of Vienna.

In 1889 Meinert[1]) described as *Philornis molesta* n. gen. n. sp. the 3' stage of a maggot occurring in subcutaneous sacs on a nestling bird from Brazilia. This maggot is very similar to *Mydæa anomala* but differs in some respects, viz. the anterior pharyngeal sclerite being broader and without the strong spine on the upper margin; still it is possible that the pharyngeal skeleton of the *Philornis* when drawn has been lying in a position that the spine has coincided with the anterior part of the sclerite, and thus given the impression of the whole sclerite being broader. The number of knobs in the anterior spiracles are recorded as 5 in *Philornis*, while I have never seen more than 4 in the 3' stage larva of *Mydæa anomala*. The general appearence and the posterior spiracles seem to be quite the same in both larvæ. — At all events *Philornis molesta* and *Mydæa anomala* are closely related species.

The synonomy of this species is thus the following:

Mesembrina anomala Jaenniche. Abhandl. herausgeg. v. d. Senckenb. naturf. Gesellschaft VI 1866—67, pag. 377.

Aricia pici Macq. R. Blanchard. Ann. Soc. Entom. Fr. LXV 1896 pag. 652.

? *Aricia pici* Macquard. Ann. Soc. Entom. Fr. 3. Ser. I. 1853 pag. 655.

? *Hylemia angustifrons* Loew. Wiener entom. Monatschr. V. 1861 pag. 41.

? *Philornis molesta* Meinert. Vidensk. Medd. Naturhist. Forening Köbenhavn 1889 pag. 304.

Here I may point out, that when the Katalog der palæarktischen Dipteren III gives *Philornis molesta* Mein. as synonymous with *Protocalliphora azurea* Fall., this is only due to the authors lack of knowledge of the Danish language. They have not realized

[1]) Fr. Meinert: *Philornis molesta*, en paa Fugle snyltende Tachinarie (Vidensk. Medd. Naturhist. Forening, København 1889 pag. 304).

that Meinerts paper treats of a Brazilian species, and because *Emberiza miliaria* is the only bird name mentioned — the Brazilian bird nestling, which contained the *Philornis* not being identified — they have supposed, that it was the host of *Philornis*. This has caused them to believe *Philornis* a European species, and with this wrong deduction it was very natural, that they should make *Philornis* a synonym of *Protocalliphora*; but the entire reasoning rests on a wrong conception, as *Emberiza miliaria* has nothing to do with *Philornis* but was merely mentioned incidentally, referring to a communication of Collett on dipterous larvæ found under the skin of a nestling of the named bird in Norway.

26.—9.—1911.

Astroclon Suensoni n. sp.

A new East Asiatic Euryalid.

Preliminary Notice

by

Dr. ***Th. Mortensen.***

In a collection of zoological objects made this year by Captain E. Suenson in the Japanese Seas on repairing telegraph cables there was, among several other interesting Echinoderms, a large specimen of a Euryalid which at once attracted my attention. On a closer examination the specimen was found to belong to the genus *Astroclon*, which was established by Lyman for a single specimen collected near the Kei Islands by the „Challenger“ Expedition (Station 192. Lat. 5° 42′ S., Long. 132° 25′ E. 129 fathoms; 26. IX. 1874). The „Challenger“ species, named by Lyman *Astroclon propugnatoris*, being still known only from the single specimen dredged by that Expedition, it was very interesting here to find another specimen, and the interest was even considerably augmented through the fact that this specimen proved to be the representative of another, quite distinct species. I shall give here a preliminary description of this new species, naming it, in honour of the collector

Astroclon Suensoni *n. sp.*

Diameter of disk 55 mm; width of arm near the disk 14—15 mm, height at the same point 12—13 mm.

The mouth angles bear at the apex a tuft of small, spine-like papillæ, the middle ones being the longest; the outer ones are only granules, and these granules continue to the edge of the mouth, covering the sides of the mouth angles. The jaws bear a bunch of papillæ-like teeth, bordered by some grain-like papillæ; the teeth are well separated from the tuft of papillæ on the apex of the mouth angles.

The underside is covered by a thick, finely granulated skin, through which no plates can be discerned. The upper side of the disk is covered by a more coarsely granulated skin, bearing numerous, irregularly arranged, large, round, white tubercles, among which one in the centre of the disk and one above the base of each arm are the most prominent. At the edge of the interbrachial spaces the limit between the coarsely tuberculated upper side and the nearly smooth underside is marked quite sharply. The radial shields appear as rather broad ribs, continuing about halfway to the centre of the disk; at the outer edge they are raised conspicuously over the base of the arms. The radial plates themselves are not seen through the thick covering skin. — The genital slits are very large, as in *A. propugnatoris*.

The arms are clad on their strongly arched dorsal side by the same coarsely granulated covering as the disk, the large tubercles continuing, without decreasing conspicuously in size or number, until the first forking. From there they diminish both in size and number, until beyond the third or fourth forking only one larger tubercle is indicated on each arm joint, or, farther out, with more irregular intervals. The smaller granules, on the other hand, continue still farther out, disappearing only on the outer, fine branches. The rings of hooklets may begin between the first and second forking, but are not regular till beyond the second forking. The underside of the arm, which is almost flat, is covered by a rather coarsely, but uniformly granulated skin. — The highly characteristic deep tentacular pits are very conspicuous far out on the arms,

gradually diminishing in size, until beyond the second forking they disappear. The arm spines are short, thick, skinclad, with the point somewhat thorny. They are arranged in transversal rows, five in number in the larger basal part of the arm. On the joints contained in the disk (7) their number is somewhat inconstant, sometimes only 4, or even 2; on the second joint there are only 2—3, on the first joint none. From the second forking the number of the arm spines diminishes, until at the outer branches there is only one; contemporaneously they become more slender, but they are not transformed into hooks.

As in *A. propugnatoris* the arms widen from the mouth towards the edge of the disk, from there diminishing in width very gradually outwards. The arms are somewhat unequally developed, both as regards their size and the distances between the forkings, as seen from the measurements of two arms given here:

	Arm A.	Arm B.
Length from base to 1. forking . . .	75 mm.	95 mm.
— — 1. - 2. — . . .	40—42 —	33 —
— — 2. - 3. — . . .	14—53 —	40—15 —

These measurements also indicate that the two branches of a forking are mostly of very unequal length.

The skin covering the upper side of the disk and the arms is of a brownish colour which makes the large white tubercles the more prominent.

The specimen was taken at lat. 32° 20′ N., long. 128° 15′ E.; 110 fathoms; bottom temperature 11,1° (52° F.). 17. V. 1911. It was, unfortunately somewhat damaged, two of the arms being broken a little inside the first forking and another arm being broken within the disk, but remaining attached by the dorsal skin. Also the specimen of *A. propugnatoris* was somewhat similarly damaged. It thus appears that the species of this genus are rather fragile in spite of their stoutness.

The main characters distinguishing this species from *A. propugnatoris* are the large tubercles on the upper side of disk and arms, the more coarsely granulated under side of the arms and the granules covering the sides of the mouth angles. Further the dark patches on disk and arms, so characteristic of *A. propugnatoris* are not found in the present species.

18.—10—1911.

Danish freeliving Nematodes.

By

Hjalmar Ditlevsen,

Zoological Museum, Copenhagen.

The present paper is a contribution to the knowledge of the freeliving Nematodes of Denmark, a part of our fauna to which almost no attention has been paid till now. It treats 59 species, distributed on 21 genera. The great majority are land- and freshwater species. I have included a few marine littoral forms which I met with accidentally, e. g. *Rhabditis marina* which Bastian described in 1866 from Falmouth. 8 species have not been described before.

Though the work is mainly faunistic there are included some observations of biological and morphological facts. Such facts will be found under the respective species.

All the animals dealt with were collected by the author. Consequently the majority originate from the surroundings of Copenhagen. A smaller part was taken near the mouth of the Isefjord, near Lynæs. The Jutland-forms I collected on a journey last summer (1910) at the expense of the Japetus Steenstrup fund, for which beg to offer my best thanks.

I am much indebted to the Carlsberg fund for the support it has given my work by enabling me to procure suitable instruments, and also for having paid the phototypic reproduction of the plates.

I wish to thank Dr. de Man in Yerseke for the kindness with which he has placed at my disposal his great knowledge whenever I have addressed myself to him.

With our present knowledge of the Nematodes it is not possible to draw a sharp line between the freeliving and parasitic forms. Thus we have the heterogene species with a parasitic and a freeliving generation, forms as *Angiostomum nigrovenosum*, common in the lungs of frogs and *Strongyloides intestinalis* whose parasitic generation lives in the intestine of man and mammals. Then we have a number of species living in putrefying substances and plant decay, many of which are transitional forms to parasitic life. It is proved that several of these forms can occasionally become parasitic; such cases are recorded from time to time in the special medical literature. As to other species it is proved of late that they can be found both as real entoparasites in plants and free in the earth. That the number of these will increase considerably in future is beyond doubt. Besides these partly or facultative parasites and besides the Nematodes of putrefaction we have for the rest the great number of species living free in earth and water, which far exceed the other groups in number. As far as our present knowledge extends, they are not parasitic though we must say that the life of a great number of forms depends on plants or particularly roots of plants. The supposition, generally found in the literature that the majority of Anguillulines live in putrefying substances is scarcely correct. Bütschli has already objected to it; he writes: „Ich suchte diese freilebende Nematoden mit ganz geringen Ausnahmen vergeblich in Wasser, Schlamm oder Erde, die schon durch den Geruch sich als deutlich faulend erwiesen. Gewöhnlich fand ich den Schlamm stark riechender Gewässer ganz frei von unseren Thierchen, ebenso die schon angefaulten Confervenmassen auf der Oberfläche derartiger Gewässer. Eine reiche Fauna unserer Thiere entwickelt sich hingegen in reinem und vorzugsweise fliessendem Wasser.“ The species found in putrefying substances are ordinarily quite distinct forms which are representatives of a few genera, the most common of which are

Rhabditis, *Diplogaster* and *Cephalobus*. De Man, who in his large Monograph exclusively deals with the „in der reinen Erde und im süssen Wasser lebenden Nematoden“ divides these in the strictest sense of the word free-living forms, after the different soil in which they live. He establishes five groups, namely:

Omnivage-Arten,
Wiesennematoden,
Sandnematoden,
Brachwassernematoden,
Süsswassernematoden.

With the word „Brachwassernematoden“ de Man indicates the forms living in earth, saturated with brackish water; he tells himself that the word is an abbreviation of „Brachwassererdenematoden“. This sort of soil which is, of course, found to a great extent in Holland has its own fauna containing forms which are neither to be found in the sea nor in freshwater. The Sand-Nematodes are especially found in dunes; the omnivaging forms occur in all sorts of earth besides fresh-water and the sea. A fact which would be of great interest to get explored, is the extension downwards in the soil of the different species of Nematodes. It is connected with the question of their dependence on the plants and could possibly also throw light upon their relation to organic substances in the earth as well as to other in the earth living organisms.

As to collecting and preparation I shall notice the following: I immediately put the gathered material which has to be examined for Nematodes in tin-boxes or in glasses with tight-fitting covers or corks; then it will not dry up and the animals will keep living for a long time. This summer I have re-examined some of the material which I gathered last summer on a journey in Jutland and which has been standing during the winter in such boxes or glasses and it proved that it still contained lots of Nematodes besides Oligochetes, Tardigrades, Podura and larvæ of Insects, in short the whole fauna which is commonly found in such material, ap-

parently well and comfortable. — For the purpose of finding the animals I employ quite flat glass-cups of c. 20 ctm. in diameter. Here I pour water over the material and spread it over the cup. It is not convenient to have too much of earth as it renders the searching for the animals difficult; it is not easy especially to search in fatty mould and clayey material. The glass-cup is placed on a black underlayer, raised a little over it, on the turned cover of a Petri-cup and then I begin the search by means of a good lens. The animals are taken with a very fine needle — for the smallest forms a pipette is employed, drawn out in a long fine tip — and placed in a watch-glass with some water. From here they are picked up and placed one by one on a slide for examination. Many of them being very agile — in that respect the various species behave most differently — it is necessary to make them immobile, and this is generally done by holding the slide for a moment cautiously over a small spirit-flame; thereafter the cover-slip is applied, which must be supported by wax or the like.

If these animals are to be prepared for study or for Museum use it is preferable to mount them on slides on account of their diminutiveness. Several fluids are recommended for fixation. De Man employes a mixture of Glycerine 3 and acetic acid $1^1/_3$. I have not succeeded in employing this and others have had the same misfortune; Örley thus says in his paper: „Die Rhabditiden und ihre medicinische Bedeutung", that „solche Präparate sehr aufhellen und schrumpfen". Jägerskjöld recommends in his paper of 1901: „Weitere Beiträge zur Kenntniss der Nematoden" a mixture of Alcohol 50 %, 70—90, Glycerine, c. 30—70 and glacial acetic acid, c. one drop. Loos recommends mixtures of a similar composition (Zool. Anz. 1901) and Örley employs picro-sulphuric, solution of corrosive sublimate and $^1/_4$ per cent solution of osmic acid. —

I have tried for my preparations most of these reagents with unequal results and moreover I have tried a number of other mixtures which I thought might be employed with success. These

animals being, as known, provided with a very thick cuticula it is of importance to find well penetrating fluids; this is not the case with osmic acid. This fluid, in my opinion, can only be employed upon diminutive species and in this case, in accordance with the well known method employed on Protozoans, namely on the slide with osmic vapour by holding the slide inverted over the mouth of a bottle containing a 1 per cent solution of osmic acid, for five minutes. As far as my experience goes, the same fluid that can be used for some forms cannot be employed with success on all. One of the mixtures which has most satisfied me and which I used for a long while is a mixture of a saturated solution of Picric acid 3 and glacial acetic acid 1. It has the advantage that it kills the Nematodes instantly and that the animals always assume their natural shape, viz. either stretched out or more or less curved, as the stiff cuticula will permit, without incalculable torsions caused by contractions of the muscles, which can be of the most disturbing effect when the animals are to be mounted on the slides. The mixture will also bring about a profitable differentiation so that the organs, often even the nuclei of the cells will appear distinctly. The weak point is that some shrinking is inevitable. I shall here add, that I never — as is generally recommended — apply the mixture from the edge of the cover-slip. I take the animal with a needle and put it direct into a watch-glass, filled with the fixation-fluid.

On account of the above mentioned shrinking I have of late employed the following mixture: Formaline, 6, Alcohol 90 %, 20, glacial acetic acid, 1 and aqua destill., 40. This I find gives very beautiful results. — Boiling with Alcohol after the method of Loos, that has proved so excellent for the greater parasitic forms is not applicable to the case under consideration. After fixation I remove the animals into a mixture of Glycerine, 1, Alcohol 90 %, 1, Aqua destill. 2 for evaporation, and thereafter they are mounted on the slide in pure Glycerine or Glycerine-Gelatine.

In spite of all pains taken I have not succeeded in getting

good preparations of all the species I have met with. Among forms difficult to prepare I may name: *Tylenchus*, *Plectus*, *Cephalobus* and the smaller species of *Diplogaster* and *Rhabditis*. On the whole the larger forms seem to give the best results on preparation, especially the Dorylaimi.

Monohystera dispar Bastian.

1865. Bastian, l. c. p. 97. Pl. IX. fig. 1 and 2.
1873. Bütschli, — p. 63. Tf. IV. fig. 24 a and b. (M. crassa).
1884. de Man, — p. 41. Tf. III. fig. 12.

I have this species, whose male is not known, only from the lake of Furesø, where it was taken quite near the bank and in the very edge of the water on roots of plants. I have only seen a few specimens; it seems not to be so common in this country as it is in Holland according to de Man. The individuals also appear to be a little smaller. The length of the specimens, I have measured, is 0,4—0,7 mm. I note here the dimensions of a mature female that had one egg in the uterus; it was taken in August 1900.

Zeiss Okularmikrom., Obj. C. Oc. 2.

Length 87 = 0,57 mm.

Oesophag. 19.

Vulva 55.

Tail 15.

Breadth 4.

The formula of de Man gives: $\alpha = 22$, $\beta = 4^1/_2$, $\gamma = 6$.

Monohystera socialis Bütschli.

1874. Bütschli, p. 28. Tf. II. figg. 8 a—d.

Bütschli found this species very abundant in a brackish-water basin named „kleinen Kiel“ in the town of Kiel. Here the animal lives essentially in the masses of Oscillaria. Bütschli tells how, taking clumps of Oscillaria with water in a glass, he saw a great number of the named species „wie Spinnweben zwischen

den einzelnen Klumpen und an den Wänden des Gefässes hinziehen; andere ballen sich zu Klumpen zusammen, in welchen sich viele Hunderte der Thierchen umeinander herumwinden". The description Bütschli gives of the behaviour of this species reminds one of other Nematodes of putrefaction, for instance *Rhabditis* and *Diplogaster*, which forms it resembles as to the great number of eggs which it produces. It is ovoviviparous, a fact that is often observed among the Rhabditides, and the body of the female is frequently swarming with large young.

I have found this species both in the Kalkbrænderihavn near Copenhagen and at Charlottenlund. And even if I have not seen it in such lots as Bütschli describes, my opinion is that it is a rather common littoral-form which will appear in putrefying seaweed and which probably can be found all round our coasts.

Monohystera crassissima n. sp.

Pl. III. Figs. 14, 15, 22.

I found the species for the first time in July 1909 among Conferves from a pool on the meadow near Øresund by Hellerup. As the material had been standing for a few days in a Petri-cup and began to putrefy I remarked that the individuals of the Nematodes increased conspicuously in number and after some days more I had a regular culture. This only kept for a while; when the putrefaction augmented the animals died rather speedily. Later I have taken the species several times at the same locality but always only single individuals and I have not succeeded in my attempts at getting a culture anew. I suppose that we here have to do with a typical Nematode of putrefaction like *M. socialis* Bütschli, the single specimens I have met with later on being young, immature individuals roamingabout.

The shape of this species is extraordinarily clumsy but it is very agile and has some resemblance to diminutive fly-maggots, which is particularly striking where it is found in abundance. It has its average width about the middle of body and is tapering at

the extremities. The cuticula is smooth, beset with long fine setæ. The lateral organ is large, circular and, when seen in profile, rather deep with a slight elevation in the centre; it is placed rather near the anterior end (fig. 22). The tail is rather short and contains three excretory glands debouching on its blunt rounded tip. The mouth is slightly cup-shaped and rather flat. Oesophagus increasing towards its proximal end, is here only a little thicker than near the mouth. The glands on the limit between the intestine and the oesophagus are not very conspicuous. The intestine consisting of two rows of cells is rather dark-coloured and frequently contains Diatoms. The ovary stretches far forwards in the body-cavity; on the preparations it can be followed beyond the proximal end of the oesophagus but then it tapers and is lost, so that it is impossible exactly to indicate the limit. Unfortunately I have no observations in that respect from living specimens. The anus is situated about half-way between the vulva and the end of the tail, a little nearer the latter. The vulva is forming a broad transverse fissure and the vagina is placed vertically to the longitudinal axis of the animal, not parallel to the rectum as often is the case in this genus. The spicules of the male are very characteristic; they are bent in an obtuse angle and being thickest in the angle they have a dilatation proximal to this on the ventral side. The tip is curved slightly upwards and ends bluntly. The distal half is surrounded by a sheath-like apparatus, consisting of a very thin membrane provided with two pointed tips stretching backwards in the animal.

Zeiss Ocularmikrom. Obj. A. Oc. 2.

♀	♂
Length 110 = 1,7 mm.	Length 90 = 1,4 mm.
Oesoph. 20.	Oesoph. 19.
Vulva 75.	Tail 13.
Anus 95.	Width 6.
Tail 15.	
Width 8.	

The formula of de Man gives $\begin{cases} ♀,\ \alpha = 14,\ \beta = 5^1/_2,\ \gamma = 7. \\ ♂,\ \alpha = 15,\ \beta = 5\ \ ,\ \gamma = 7. \end{cases}$

Monohystera similis Bütschli.

1873. Bütscli, p. 62. T. V· fig. 30 a—b.

1884. de Man, p. 40. T. III. fig. 11.

Referring to the descriptions which Bütschli and de Man have given of the species, I shall point out, that it is frequently found in the Ordrup Mose in the pools near the gate which leads to Dyrehaven at the house of the „Posemand". It lives here especially among Lemna trisulca and on the roots of Hydrocharis morsus ranæ. It is very agile with characteristic movements; it swims by putting the body in a quickly swinging or oscillating motion like the larvæ of certain gnats. When it has advanced a little in this manner it stops short with the body stretched out and lies as dead, till it after a moment resumes its movements in the described manner.

Tripyla papillata Bütschli.

1873. Bütschli, p. 52. T. VI. fig. 35 a—b.

1884. de Man, p. 47. T. V. fig. 19.

This species has been taken in the Furesø and in the Lyngby Sø where it seems to be very common. In the Furesø it occurs on the roots of the plants in the edge of the water, in the Lyngby Sø it was taken on the roots of Stratiotes aloides. Besides this a single specimen was found in damp moss near the bank of a little pond in Dyrehaven, near Springforbi.

Tripyla affinis de Man.

1884. de Man, p. 48. T. V. fig. 20.

De Man writes, that this species occurs in „die feuchte Erde der Wiesen und Marschgründe"; the Danish localities are all near the sea or brackish water. It was taken on the meadow near Øresund by Hellerup together with *Oncholaimus thalassophygas* de Man and other typical „Brackwassernematoden"; other localities are Hundested and Lynæs, near the Isefjord, on roots of plants.

Tripyla setifera Bütschli.

1873. Bütschli, p. 51. T. VI. fig. 36 a—f.

1884. de Man, p. 46. T. IV. fig. 17.

Bütschli found this species on the roots of fungi in a wood, de Man indicates both roots of plants in the moist meadows of Holland and in mould. The only locality where it has been found in Denmark is in swampy tracts of boggy land between Hulsig and Kandestederne, near the Scaw.

Cyatholaimus intermedius de Man.

1884. de Man, p. 53. T. VI. fi. 25.

In Lynæs were taken two females and one male. The females have been collected near the harbour on roots of grass in a little pond used as watering-place for cattle. The male originates from roots of plants near the Isefjord. The male differs from the species of de Man in having 6 præanal papillæ.

I note the measurements for a male and a female.

Zeiss Okularmikrom. A., Oc. 2.

♂	♀
Length 74 = 1,1 mm.	Length 64 = 1 mm.
Oesoph. 9.	Oesoph. 9.
Tail 7.	Vulva 28.
Width 2.	Tail 7.
	Width 2.

The formula of de Man gives $\begin{cases} ♂,\ \alpha = 37,\ \beta = 8,\ \gamma = 10. \\ ♀,\ \alpha = 32,\ \beta = 7,\ \gamma = 9. \end{cases}$

Spilophora glophila de Man.

Pl. IV. figs. 32 and 34.

1876. de Man, p. 85. T. X. fig. 40 a—b.

1884. de Man, p. 58. T. VII. fig. 29.

This species has been collected on the meadow by Hellerup near Öresund in a few specimens. It appears to differ inconspicuously from the illustrations of de Man in respect to the chitinous thickenings of the mouth-cavity; the oral bristles also are relatively

a little thicker on the specimens from Hellerup (see the figs. 32 and 34).

Chromadora Leuckarti de Man.

1884. de Man, p. 58. T. VIII. fig. 30.

A young specimen, female, taken at the Furesø 5. VI. 11. There is certainly no doubt that it is the species named; it agrees perfectly with the description of de Man. The animal is 0,8 mm in length.

Zeiss Okularmikrom. Obj. C. Oc. 2.

Length 134 = 0,8 mm.

Oesoph. 19.

Vulva 62.

Tail 17.

Width 4.

The formula of de Man gives: $\alpha = 32$, $\beta = 7$, $\gamma = 8$.

Chromadora Orleyi de Man.

Pl. IV. figs. 35 and 37.

1884. de Man, p. 59. T. VIII. fig. 31.

This species was also taken at the Furesø among plants in the edge of the water, only once, but in many specimens. In a male I have counted 16 præanal papillæ of the typical form. The male spicules differ a little in form from the illustration given by de Man in having a dilatation in its proximal end (see fig. 35).

Hypodontolaimus inæqualis (Bast.).

1865. Bastian, p. 166. T. XIII. fig. 223—225.

1874. Bütschli, p. 44.

1886. de Man, p. 66.

1888. de Man, p. 39.

1904. Jägerskjöld, p. 417.

This species seems to be common at the coasts of Öresund. It has been collected in the „Kalkbrænderihavn“ near Copenhagen,

at Charlottenlund and Klampenborg among Ulva and Enteromorpha. It is evident that it requires only a small degree of saltness as it has been taken together with *Oncholaimus thalassophygas* d. M. on the meadow by Hellerup near Öresund.

Mononchus papillatus Bastian.

1865. Bastian, p. 101. Pl. IX. fig. 27—28.

1873. Bütschli, p. 76. T. III. fig. 19 a—b.

1884. de Man, p. 64. T. IX. fig. 35.

Evidently this species is very common in Denmark; it has been taken at Lynæs, at the Furesø by Frederiksdal, Lyngby Mose, Charlottenlund and Kildeskoven. In Jutland it was collected at Kandestederne, in a pond among the dunes by Lønne and at Nymindegab opposite to the mouth of Ringkøbing Fjord. It can by no means be called „ziemlich selten“ here such as de Man indicates it to be in Holland. De Man notes that it occurs „in der feuchten Erde auf Wiesen und Marschgrüuden sowohl in Süsswasser- als in Brackwassergegenden“; this also agrees with its occurrence in Denmark. A curious fact is, that it can be found both in sandy marshland, among dunes and in fat mould.

The Danish form agrees almost perfectly with the description of de Man, differing only in the fact that the chitinous list situated in the cavity of the mouth opposite to the dorsal tooth is slightly serrated, a fact which has not hitherto been observed.

Mononchus spectabilis n. sp.

Pl. III. figs. 17, 19, 27, 28, Pl. IV. fig. 36.

In March 1910 the author found in some material from the meadow by Hellerup near Öresund several Mononchs resembling highly the *Mononchus papillatus*, only conspicuously larger and, what is the most remarkable, the males being about as numerous as the females.

All the species of the genus *Mononchus* show the peculiarity that they will float on the surface of the water as if their cuticula

were greasy. If some material is spread in a flat glass-cup and water is poured over it, the Mononchs will mount rapidly and be lying on the surface dry and shining. This peculiarity I have only observed in one genus besides the Mononchs, namely in the genus *Ironus*. It seems to be a peculiarity of these genera; I have seen it as well in *Ironus ignavus* as in *Ironus longicaudatus* and it is the case with all the species of *Mononchus* I have examined. It is very remarkable and it has surprised me that it is mentioned nowhere in the literature. In the case referred to, the Nematodes suddenly swarmed to the surface of the water which was poured out over the material in a glass cup: they resembled perfectly diminutive steel-needles which had suddenly become alive, and it was now an easy matter — on account on the largeness of the species — to pick them up and place them into a watch-glass.

The examination of the animals gave the following result: the females reached the length of 4 mm, the males the length of 3,6 mm. As to form and aspect the animals agree in some measure with the *Mononchus papillatus*. Behind the head the body is inconspicuously constricted. The cavity of the mouth is about twice as long as wide, the distal half being a little wider than the proximal half in that this is tapering towards the oesophagus, in the distal end of which it is ending pointed. In this way the oesophagus is encompassing about the proximal third of the mouth-cavity. The dorsal tooth is placed in the upper half of the mouth and its apex is running obliquely inwards and forwards. The decurrent edge of the tooth is visible to the commencement of the oesophagus. Opposite to the tooth is found a thickened chitinous ridge the middle of which is serrated. Between this and the tooth another chitinous list is seen without serration and relatively inconspicuous. The shape of the cavity of the mouth is on account of these lists prismatic, triangular in transverse section. The oesophagus is very muscular and has a conspicuous chitionous intima, which reaches a little way downwards into the lumen of the intestine, a case not uncommon in the Mononchs. The vulva is placed

a little behind the middle of the body; the ovaries do not reach far; the postvaginal part does not reach the middle between the vulva and the anus; the antevaginal part about a third of the distance to the proximal end of the oesophagus. Usually are found two eggs in the uterus, sometimes I have observed more, up to four. The cells of the intestine are filled with oil-globules. The tail is conical and pointed and always highly bent inwards, towards the vent, getting the shape of a hook.

The male is inconspicuously more slender than the female and increases from the point where the masculine papillæ commence, in the way that the animal assumes its greatest circumference at the anus. The bursal musculature is highly developed and the numerous papillæ which are very prominent appear to have a lateral position, forming two longitudinal rows between which the body of the animal appears to be groove-shaped. The spicules are angular and provided with a longitudinal list in their distal half; an accessory piece of a characteristical shape much resembling that of *M. tridentatus* figured by de Man in 1876, T. XIII, fig. 50.

There is no doubt, that the form here described is closely related to the *M. papillatus*, especially as a more thorough examination has proved, that the *M. papillatus* is also provided with a serrated list opposite to the dorsal tooth. The principal deviations between the two forms are the following: 1) the difference of dimensions, 2) the position of the vulva which in *M. spectabilis* is situated a little behind the middle of the body, in *M. papillatus* at the beginning of the last third part of the animal; 3) the length of the tail, which is more considerable in *M. papillatus* and finally the fact, that the male of the *M. papillatus* is unknown, while the male of the *M. spectabilis* is about as numerous as the female.

If the two forms should prove to be identical it must be supposed that an alternation of generations takes place such as de Man supposes with *Trilobus*, but for the present I find it most correct to consider the *M. spectabilis* as specifically different from *M. papillatus*.

Zeiss Okularmikrom. A. Oc. 2.

Female.	Male.
Length 250 = 4 mm.	Length 228 = 3,6 mm.
Oesoph. 50.	Oesoph. 46.
Vulva 135.	Tail 5.
Tail c. 8.	Width 5.
Width 8.	

For the female the formula of de Man gives: $\alpha = 31$, $\beta = 5$, $\gamma - 5$.

Mononchus brachyuris Bütschli.

1873. Bütschli, p. 77. T. III & IV. fig. 20 a—e.

1884. de Man, p. 66. T. IX. fig. 37.

This species has in Denmark about the same distribution as *M. papillatus* but it is decidedly more unconmmon. Hitherto I have not seen the male, which for the rest is known. The species is apparently fond of dampness like the other Mononchs. It was collected on the roots of *Menyanthes trifoliata* in a bog at Lynæs. Further it has been taken in the bog by „Vintappergaarden", near Lyngby. In Jutland it was collected in the boggy regions between „Hulsig" and „Kandestederne", in a bog near the „Kandestederne" and on roots of plants at the bank of a pond between Nymindegab and Nørre-Nebel.

Mononchus macrostoma Bastian.

1865. Bastian, p. 101. Pl. IX. fig. 29—30.

1884. de Man, p. 63. T. IX. fig. 34.

Among all the Danish Mononchs this species has the widest distribution; it has been collected at nearly all the places where I have met with other species of the genus. It is one of the most common of all our freeliving Nematodes. On Sjælland it has been collected at the „Furesø", in the Ermelund, on roots of plants, in Lyngby Mose, Hellerup Strandeng, Ordrup Mose, at Lynæs in a bog near the plantation. Further it has been taken on the little

island Egholm in Storebelt where it was found in abundance in a little pool. In Jutland is was taken on the northern shore of the Scaw where it occurs in a ditch among the dunes near the sea; at „Kandestederne“ in a bog, and finally in the little pond at Lønne near Nørre-Nebel. The male was observed only once, namely in Ordrup Mose, Aug. 1909.

Mononchus dolichurus n. sp.

Pl. II. figs. 6, 10, 11.

This exceedingly nice and characteristic form was found in the wide boggy regions between Hulsig and Kandestederne in Jutland. In spite of an eager search in the material it has been impossible for me to find more than one specimen, a female. Though not still mature — the female organs are just laid down and form a little sausage-shaped body which indicates the place of the vulva not yet developed — the animal has a length of ca. 4 mm. Thus it will probably prove to be larger than most of the other species of this genus.

The front part which tapers very little is beset with two circles of rather conspicuous papillæ; behind these the body is inconspicuously constricted as in *M. spectabilis.* The cavity of the mouth, which in optical section appears to be regularly barrel-shaped, is probably prismatic and in transverse section triangular. The dorsal tooth, which is relatively small and has its apex turned downwards, is placed in the proximal half of the mouth-cavity; its distance from the bottom is about the third of the length of the former. Besides this tooth some inconspicuous conical prominences are found partly opposite to the tooth, partly in the bottom of the mouth-cavity. I count all in all seven. Oesophagus has the form usually found in the Mononchs but has three or four inconspicuously developed lobes at its proximal end. a case not found in other species of this genus (Fig. 11). The tail, after which I have named the animal, is longer than in any species of this genus hitherto known; it measures but 4'/2 in the length of the animal.

It is kept bent inwards towards the vent forming a regular circular arch. (fig. 10). The movements of the animal are very slow.

After having written the above, the material in which the specimen dealt with was found has been re-examined and I succeeded in finding one specimen more, unfortunately also an immature female being a little smaller than the individual which was found at first. It gives no further information.

Zeiss' Okularmikrom. Obj. A. Oc. 2.

Length 247 = 4 mm.

Oes. 62.

Vulva 148.

Tail 55.

Width 6.

The formula of de Man gives: $\alpha = 41$, $\beta = 4$, $\gamma = 4^1/_2$.

Oncholaimus thalassophygas de Man.

1884. de Man, l. c. p. 68. T. X. fig. 39.

1889. de Man, p. 1. T. VI. fig. 1 a—c.

There is not much to be said of the distribution of this species in this country; it is very common on Hellerup Strandeng. It occurs in pools that are by turns filled with water and dry. It was collected on the roots of Scirpus and Aster tripolium and among Conferves. Besides the named locality it has only been taken at Dragør near the „Badehotel", a place resembling that at Hellerup. The Danish specimens agree essentially with the specimens described by de Man from the isle of Walcheren.

Oncholaimus viridis Bastian.

1865. Bastian, l. c. p. 137. Pl. XI. fig. 137 and 138.

A form resembling the *Oncholaimus viridis* occurs abundantly at our coasts. The different proportions do not agree perfectly with what is known of this species. On the other side this is the only one of the species with a single ovary of this genus described by Bastian, to which it can be ranged with some reasonableness. I

have not found it reasonable to establish for the present a new species on it. It has been collected at Charlottenlund, in the „Kalkbrænderihavn“ and at Lynæs among putrefying seaweed.

Zeiss' Okularmikrom. A. Oc. 2.

♀ Length 292 = 4,7 mm.

Oes. 26.

Vulva 222.

Tail 3.

Width 4.

Oncholaimus oxyuris n. sp.

Pl. II. figs. 8, 9, 12, 13.

This form, so far as I can see new to science, has been collected on Hellerup Strandeng and later in Dragør, near the „Badehotel“. It appears to be closely related to *Oncholaimus viridis* Bast. which it resembles in several respects, but it differs from this species in having the tail rather different in form. — The head is truncate, with a circlet of 10 short, stout setæ. The length of the pharyngeal cavity is about twice its width and provided with the usual 3 teeth among which the ventral tooth is the larger. The porus excretorius is placed at a distance behind the bottom of the pharyngeal cavity equal to the length of the latter. The female organ is unsymmetrical like that in *O. viridis* and stretches forwards in the body; the uterus is rather spacious and is able to contain a considerable number of eggs, up to eleven. The vulva is not prominent as is the case in *O. viridis*. The tail is tapering considerably behind the anus and the tip of the former is constricted to a little finger-shaped appendage, curved towards the vent. The tail of the male differs somewhat from that of the female and is on the ventral side slightly spoon-shaped. The edge of this excavation is on both sides beset with a row of very strong and stout setæ. Between the spoonshaped excavation and the tip of the tail is placed a postanal, domical papilla which is possibly double. The

spicules are rather short, slender and slightly curved; no accessory piece.

As for the female the following measurements have been taken on a specimen which de Man has had the kindness to examine; the results of my measurements differ a little from those of de Man; this difference is probably caused by the considerable bending of the animal prepared rendering exact measuring difficult. I have found it correct to give my own results here. The above mentioned deviations are insignificant.

Zeiss Okularmikrom. A. Oc. 2.

♀ Length 250 = 4 mm.	♂ Length 238 = 3,8 mm.
Oes. 35.	Oes. 33.
Vulva 172.	Tail c. 4.
Tail 5.	Width 5.
Width 5.	

De Man's formula $\begin{cases} ♀,\ \alpha = 50,\ \beta = 7,\ \gamma = 50. \\ ♂,\ \alpha = 47,\ \beta = 7,\ \gamma = 60. \end{cases}$

Eurystoma terricola de Man.

1907. de Man, l. c. p. 84. T. IV. fig. 17.

This nice form has been collected in several specimens at Lynæs, near the bank of the Isefjord, partly on the roots of Salicornia and Atriplex partly among horse-manure, lying on the beach. After de Man it occurs in „la terre humide aux bords des fossés d'eau saumâtre à l'île de Walcheren".

Enoplus communis Bastian.

1865. Bastian, p. 148. Pl. XII. fig. 164—166.

1866. Schneider, p. 57. T. IV. fig. 9—13 (*E. cochleatus*).

1874. Bütschli, p. 40. fig. 55 a—b.

Lynæs, on roots of plants in the edge of the water by Isefjord; Dragør, near the Badehotel.

Ironus ignavus Bastian.

Pl. IV. fig. 33.

1865. Bastian, p. 104. Pl. IX. fig. 34 a—b.

1876. Bütschli, p. 384. T. XXV. fig. 15 a—e.

1884. de Man, p. 70. T. X. fig. 40.

This species occurs rather abundantly in the Dyrehaven near the Fuglesangsø. It lives here in black mud and damp mould where it would be almost impossible to find it, if it had not the same peculiarity as the Mononchs, namely to swim on the surface of the water. If some mud is spread in a flat glasscup and water is poured over it the animals will mount to the surface where they can be easily collected by help of a needle. Later the species has been taken at the Furesø together with *Dorylaimus stagnalis* and *Trilobus gracilis*, just the same species among which Bütschli has collected it in the river of Main. The female organ, the characteristic ring-musculature of which is discussed both by Bütschli and de Man, I have taken the opportunity to figure. The dimensions of the Danish specimens agree principally with those from the river of Main.

I note the measurements of a female of middle size:

Zeiss Okularmikrom. A. Oc. 2.

Length 213 = 3,4 mm.

Oes. 39.

Vulva 111.

Tail 13.

Width 4.

Phar. cavity $7^1/_2$.

The formula of de Man gives: $a = 53$, $\beta = 5^1/_2$, $\gamma = 16$.

Ironus longicaudatus de Man.

1884. de Man, p. 71. T. XXXIV. fig. 140.

The *I. longicaudatus* occurs at localities much resembling those in which *I. ignavus* lives; it has f. i. been taken in mud from the Fuglesangssø in Dyrehaven. Further it has been collected

in a pool in Dyrehaven near Springforbi. In Jutland it was taken in a trench between Nørre Nebel and Nymindegab with very ferruginous water.

While the male of *I. ignavus* occurs about as abundantly as the female this is not the case with *I. longicaudatus*; though I have collected a lot of specimens I have not met with a single male.

I give the measurements for a female with two eggs in the uterus.

Zeiss Okularmikrom. A. Oc. 2.

Length 166 = 1,2 mm.

Oes. 26.

Tail 40.

Vulva 66.

Phar. cavity 7.

Width 4.

The formula of de Man givos: $\alpha = 41$, $\beta = 6^1/_2$, $\gamma = 4$.

Trilobus gracilis Bastian.

Pl. III. figs. 16 and 20.

1865. Bastian, p. 99. Pl. IX. fig. 20—22.

1873. Bütschli, p. 53. T. IV. fig. 21 a—e, 23 a—b.

1884. De Man, p. 75. T. XI. fig. 43.

This exceedingly nice Nematode occurs in this country abundantly in Furesø and Lyngby Sø. A single specimen has been taken in the Bøllemose near Skodsborg. It appears as if the specimens from the Furesø generally are a little larger than those from other localities; they have been taken in the edge of the water on roots of plants and often attain a length of 3 mm.

In one female specimen I have found a peculiar monstrosity: The animal had two eggs in the uterus, one antevaginal and one postvaginal. But between the vulva and the anus occur four well developed masculine papillæ of the shape characteristic for the males of this species and in no respect to be distinguished from these. No spicules are found and, as far as can be seen, no testes; apart

from these papillæ the animal appears to be a female normally developed.

As I have not seen any case of that sort in freeliving Nematodes mentioned in literature I have figured the organs dealt with.

Trilobus pellucidus Bastian.

1865. Bastian, p. 100. Pl. IX. figs. 23, 24.

1884. De Man, p. 76. T. XI. fig. 44.

This species is not rare in Denmark, but its distribution is probably different from that of the above named species as they have not been found together. I found the T. pellucidus in a bog by Lynæs from which locality several specimens were collected. Moreover it has been taken at the Kandesteder in Jutland, in sandy mould, and finally one specimen has been taken in Ordrup Mose in water.

According to my experience it must be supposed that of the two species of the genus Trilobus, *Tr. gracilis* is particularly a freshwater-form while *Tr. pellucidus* is attached to brackish water. I may note therefore, that Bastian indicates *gracilis* to be found „about the roots of Ruppia maritima from brackish water" while *pellucidus* is found in „mud from bottom of ponds". De Man notes that *gracilis* „bewohnt nicht nur die feuchte Erde, welche von süssem oder brackischem Wasser durchtränkt ist. sondern auch das süsse Wasser selbst, in Gräben und Teichen".

Prismatolaimus dolichurus de Man.

Pl. III. fig. 18.

1384. De Man, p. 80. T. XII. fig. 47.

I have seen this species only once among material from Lynæs and only one specimen. It was found together with *Mononchus papillatus* and *Plectus granulosus* on roots of plants originating from the little bog behind the church. In this species there is a peculiarity at the oesophagus which de Man does not mention in his text but which is visible in his figure; this peculiarity consists in a rather conspicuous constriction by which the proximal

part of the oesophagus is separated from the other. In the specimen from Lynæs this peculiarity was rather more conspicuous than in that figured by de Man.

Cylindrolaimus tristis n. sp.

Pl. III. figs. 21, 23, 26.

The only species of this genus which was collected here agrees with none of the species described by de Man. I have taken it in the Furesø for two years successively in the same locality, namely between Hjortholm and the biological laboratory. It occurs on roots of plants in the edge of the water. Its movements are exceedingly characteristic: It does not swim but it moves very slowly with the most awful writhings, bending its body extraordinarily abruptly at a single or more spots as if intending to break it to pieces; at the same time the animal is trembling as if very miserable and piteous. I suppose these movements are peculiar for the genus partly because de Man has named one of his two species *C. melancholicus*; it would be just as suitable for the species from the Furesø; I consequently named this species *C. tristis*.

The species from the Furesø is considerably larger than the two known from Holland; while the larger of these is a little more than one milimeter long the Danish species measures almost two. But it is relatively much more slender. The body is tapering slightly forwards with a rounded head devoid of lips. I have not been able to state if setæ are present, at any rate they are exceedingly small and inconspicuous. The lateral organ placed near the head is of a shape diverging from that known in the species from Holland; in profile it has the shape of a narrow funnel running obliquely inwards in the body, forming an angle of nearly 45° with the long axis of the former. It is not to be seen in my figure which was drawn after a specimen prepared where it was not visible. I have only seen it on living animals and always rather indistinctly. The oesophagus is long and increases towards its proximal end. Its Chitin-intima, as also observed by

de Man in the Dutch species, reaches a little way into the lumen of the intestine. The vulva is forming a broad transverse fissure; the female organ is single and extends forward in the animal. Uterus contains never more than one egg, which is very large and cylindriform; in a female of the length of nearly 2 mm it measures 165 μ in length. The tail relatively a little longer than in the former described species tapers evenly, ending with its apex rounded and a little dilated with a distinct duct for the caudal glands.

All the specimens collected are females.

Zeiss Okularmikrom. Obj. C. Oc. 2.

Length 270 = 1,8 mm.

Pharyngeal cavity: 8.

Oesophagus 70.

Vulva 160.

Tail 20.

Width 4.

The formula of de Man gives: $\alpha = 67$, $\beta = 3$, $\gamma = 13^1/_2$.

Diplogaster rivalis Leydig.

1873. Bütschli, p. 120. T. XI. fig. 68.

1876. — p. 371. T. XXIII. fig. 5 a—b, and XXIV. fig. 5 c.

1884. De Man, p. 86. T. XII. fig. 50.

1886. Örley, p. 42.

It was taken at Ordrup Mose, behind Christiansholm, in a little pool filled with Conferves. I got both male and female, the latter with large and lively young. The species appears to have no wide distribution in this country.

Diplogaster fictor Bastian.

1865. Bastian, p. 116. Pl. X. fig. 171—173.

1884. De Man, p. 88. T. XIII. fig. 51.

A male was taken at Lynæs, the length of which measures 1,2 mm.

Zeiss Okularmikrom. A. Oc. 2.

Length 76.

Oes. 13.

Tail 9.

Width $1^1/_2$.

Diplogaster longicauda Claus.

Claus, l. c. p. 354.

This species I have found in putrefying fungi in the Kilde-skov together with a short-tailed form of the same genus which I did not succeed in determining to species.

Diplogaster gracilis Bütschli.

1876. Bütschli, p. 373. T. XXIII. fig. a—c.

Also this species were collected in the Kildeskov in putrefying fungi. It agrees with the *D. longicauda* in having the tail tapering very much posteriorly and terminating in a long pointed extremity. It is easily known by its female organ being unsymmetrical, with the vulva placed a little before the anus. The male has an inconspicuously developed bursa and two long slender spicules, with a scarcely visible accessory piece.

Cephalobus elongatus de Man.

1884. De Man, p. 96. T. XIV. fig. 57.

1906. Kati Marcinowski, p. 215.

Only two species were found of the genus Cephalobus. *C. elongatus* was collected in the Kildeskov in a putrefying stub. It appears to me beyond doubt that it occurs here as a veritable Nematode of putrefaction; I kept it for weeks in a little glass filled with the putrefying wood-mass in which the animals propagated lively. De Man indicates that the species „bewohnt nicht nur die feuchte, oder von süssem oder brackischem Wasser getränkte Erde der Wiesen und Marschgründe, sondern auch den sandigen Dünenboden an den Wurzeln der dort wachsenden Pflanzen“. After later

examination by Kati Marcinowski it appears that this species can also occur entoparasitic in plants. M. writes: „Nach den im folgenden niedergelegten Beobachtungen lebt das Thier auch im Korn keimender Getreidepflanzen, vermag auch in oberirdische Pflanzenteile einzudringen und so zeitweise als Parasit zu leben. Auch in Wasser, dem eine geringe Menge lebender und gestorbener Pflanzenteile zugesetzt waren, sowie auf einer in Wasser auf Mohrrübenscheiben gezüchteten Pilzkultur konnte *C. elongatus* nicht nur wochenlang am Leben erhalten werden sondern pflanzte sich auch fort".

We have here one instance more of the peculiar ability of certain nematodes to accomodate themselves to the most different circumstances.

Cephalobus persegnis Bastian.

1865. Bastian, p. 124. Pl. X. fig. 104—106.

1884. De Man, p. 92. T. XIII. fig. 52.

This species has been collected in the Kildeskov partly in old stubs together with the above named species and partly among putrefying leaves on the earth. Both species contained ripe eggs in the month of February.

Plectus cirratus Bastian.

1865. Bastian, p. 119. Pl. X. fig. 81 and 82.

1884. De Man, p. 110. T. XVII. fig. 68.

A female has been taken at Lynæs, near Isefjord on roots of plants. The uterus contained three eggs. I note the measurements taken.

Zeiss Okularmikrom. A. Oc. 2.

Length 71 = 1,1 mm.

Oesoph. 15.

Vulva 33.

Tail 10.

Width 3.

After de Man's formula this gives: $\alpha = 24$, $\beta = 5$, $\gamma = 7$.

Plectus granulosus Bastian.

1865. Bastian, p. 120. Pl. X. fig. 93 and 94.

1873. Bütschli, p. 92. T. VII. fig. 47 b and T. VIII. fig. 47 a and c.

1884. De Man, pag. 107. T. XVI. fig. 65.

This species is very common in this country. De Man indicates it to be „omnivag“ and it is evident, that it is able to accomodate itself to the most different localities. It has been taken at Lynæs, on roots of plants near the Isefjord, in the Kildeskov among putrefying leaves on the earth, in Frederiksdal, near the Furesø and at Hellerup Strandeng on roots of plants.

Plectus parietinus Bastian.

1865. Bastian, p. 118. Pl. X. fig. 79, 80.

1873. Bütschli, p. 89. T. III. fig. 17, T. VII. fig. 46 a—c. fig. 39, T. VIII. fig. 52.

1884. De Man, p. 109. T. XVI. fig. 67.

Also this species appears to be widely distributed here. It occurs in the Kildeskov where it has been taken among putrefying leaves on the earth and at Hellerup Strandeng, among conferves on damp sandy soil. On the little island Egholm in Storebelt it was collected together with *Mononchus macrostoma*.

Plectus rhizophilus de Man.

1884. De Man, p. 113. T. XVII. fig. 72.

A single specimen from the boggy land between Hulsig and Kandestederne.

Rhabditis brevispina Claus.

1884. De Man, p. 122. T. XVIII. fig. 79.

A Rhabditis taken in damp earth between Lynæs and Hundested I suppose to be identical with *R. brevispina* Claus. Several mature specimens were found together, all females. One of the largest specimens attains a length of 1 mm.

Zeiss Okularmikrom. A. Oc. 2.

Length 72 = 1,1 mm.

Oes. 10.

Vulva 26.

Tail 10.

Width 4.

Formula of de Man: $a = 18$, $\beta = 6^1/_2$, $\gamma = 7$.

Rhabditis terricola Dujardin.

1845. Dujardin, p. 240.

1873. Bütschli, p. 107. T. XI. fig. 64 a—h. T. X. fig. 64 a.

1886. Örley, p. 35. T. II. fig. 10—17.

This species was taken in the Kildeskov in putrefying fungi and on a field between Hellerup and Charlottenlund in horse-manure.

Rhabditis pellio Schneider.

1866. Schneider, p. 154.

1873. Bütschli, p. 112. T. IX. fig. 59 a—d. T. X. fig. 59 e.

1886. Örley, p. 33. T. I.

In culture, established on dead lumbrici in earth I have got this form several times. I have never taken it free in the earth.

Rhabditis marina Bastian.

Pl. II. figs. 1, 2, 3, 4, 5, 7.

1865. Bastian, p. 129, Pl. X. fig. 60—62.

Last year in the month of April this species was taken at the beech of Charlottenlund among putrefying sea-weed, Enteromorpha and Ulva. Under the microscope it proved to be highly pellucid, of a very nice form and of a size unusual in the group of the Rhabditidæ.

The shape is rather slender, tapering at both ends. The cuticula shows transverse striæ and under high magnifying powers also longitudinal striæ. The mouth is surrounded with six inconspi-

cuously prominent lips, devoid of papillæ; no setæ. The cavity of the mouth has the same width throughout its whole length and is prismatic; it measures about $^1/_{12}$ of the length of the oesophagus; this contains an enlargement distinctly limited in the middle and has the proximal globular bulbus provided with the usual valvular apparatus. The intestine, the cells of which are filled with oil-drops of various dimensions, is much larger than the oesophagus. The porus excretorius is very indistinct and hardly observable; it is placed a little behind the middle of the proximal half of the oesophagus. Vulva which is placed slightly posterior to the middle of the body is rather prominent and forms a broad transverse fissure. The female organ is double; the uterus is very large and the ovaries extend far forward and backward in the body. In this respect individual differences occur; in many cases the distance of the bending of the antevaginal ovary from the proximal end of the oesophagus is equal to the half of the length of the latter, often, especially in older females, this distance is much shorter. The terminal ends of the ovaries nearly reach each other opposite to the vulva; in younger specimens there can be a conspicuous distance between them (fig. 4). The species is ovoviviparous, having in older specimens the large uterus abundantly filled with lively moving young and ova in all stages of development In the figure 4, of a young female, is seen a lot of shell-eggs two of which are showing stages of cleavage. — The conical shaped tail is not narrowing to a point as Bastian indicates but shows under high magnifying powers a little globular dilatation (fig. 7). No duct for caudal glands is seen.

In the male the bending of the single testis reaches forward in the body to a distance from the proximal end of the oesophagus about equal to the length of the latter. The terminal end of the testis is placed nearly at the middle of the body. The bursa encompassing the tip of the tail has on each side 2, 2, 3, 2 supporting-rays. (figs. 1, 2). The spicules, each of which are showing two longitudinal lists, are slightly curved and have a dilatation in

their proximal half. The proximal end is obliquely cut off; an accessory piece, triangular isosceles, is found (fig. 3).

It is beyond doubt that this form, just as the other members of the genus *Rhabditis*, is a nematode of putrefaction. They congregate where seaweed, probably also see-animals lie rotting. Immediately after the material was collected it contained apparently no Rhabditides; it is impossible that I should not have observed this large form if it had been present in a tolerable number; probably some larvæ must have been present, but at any rate their number was so little prominent that they were not observed under the examination. First when the material had been standing for some time in my room in a glass-cup and I examined it anew, it proved to be swarming with *Rhabditis marina* in all stages of development, in short, that I had got a culture of this species. However a culture is not always so easily to be got. I have attempted it several times with a negative result; and a culture so beautifully developed as the first time I have not later succeeded in getting.

Zeiss Okularmikrometer A. Oc. 2.

Old female:	Young female:
Length 195 = 3,1 mm.	Length 100 = 1,6 mm.
Oes. 24.	Oes. 18.
Vulva 100.	Vulva 55.
Tail 10.	Tail 6.
Width 8.	Width 5.

Male:

Length 100 = 1,6 mm.

Oes. 16.

Width 4.

For the old female de Man's formula gives: $\alpha = 24$, $\beta = 8$, $\gamma = 19^1/_2$.

Aphelenchus sp.

All that I know about the genus Aphelenchus is that one species occurs in Denmark. A female was taken in the Kildeskov

the 20. 2. 10. After thawing weather for some days the lying snow had partly melted and the earth under the trees was covered with putrefying leaves; among these it was taken, only one specimen, together with *Plectus parietinus*, *Plectus granulosus* and *Cephalobus persegnis*. It did not appear to agree with any of the species of de Man. Accidentally I lost the specimen under the preparation and I have only these few notes and the measurements taken on the living animal.

Length 871 μ.
Oes. 79 -
Vulva 587 -
Tail 52 -
Width 19 $\frac{1}{2}$
Spear 13 -

Tylenchus Davainei Bastian.

1865. Bastian, p. 126. Pl. X. fig. 109—11.
1873. Bütschli, p. 37. T. I. and II. fig. 7 a—c.
1884. De Man, p. 151. T. XXIV. fig. 100.

I have only seen a few freeliving species of the genus *Tylenchus* and of these species only a single or a few specimens. *T. Davainei* was taken in Ordrup Mose behind Christiansholm. It was a mature female with one egg in the uterus and was found on roots of grass in sandy clay, July 1910.

Tylenchus robustus de Man.

1884. De Man, p. 144. T. XXII. fig. 92.

This species was taken in the „Vintappergaarden"s Mose on roots of grass, only a few specimens.

Tylenchus dubius Bütschli.

1873. Bütschli, p. 39. Tf. II. fig. 9 a—e.
1884. De Man, p. 145. T. XXII. fig. 93.

Hellerup Strandeng, a few specimens.

Dorylaimus obtusicaudatus Bastian.

1865. Bastian, p. 106. Pl. IX. fig. 41, 42.
1884. De Man, p. 167. T. XXVI. fig. 109.
1906. — p. 163, fig. 8, 9.

This specimen is exceedingly common and widely distributed. De Man writes: „Ich beobachtete es überall, in allen Gründen dieses Landes“; as to Denmark the same can be written. It was taken in the following localities:

Lynæs N. of the plantation; Dyrehaven at the Fuglesangssø; in the Kildeskov among putrefying leaves; Ordrup Mose, on roots of plants; Hellerup Strandeng, on roots of plants; Vintappergaardens Mose; Lyngby Mose, in moss; Eremitagesletten at Springforbi. On Langeland it was taken at Hjortholm, on roots of moss: in Jutland it was collected at Varde Aa; in a trench between Nørre Nebel and Nymindegab; in a pond at Lønne; in boggy land near Kandestederne; at Skagens Nordstrand in a ditch near the sea. Only once I met with a male specimen which was taken at Springforbi.

Dorylaimus intermedius de Man.

1884. De Man, p. 170. T. XXVII. fig. 113.

De Man writes about this species that the male is taken more frequently than the female, a rather isolated fact in this group. I have taken the species only twice, a male specimen at Lynæs, in the bog near the plantation and a female in the Kildeskov among putrefying leaves, in the month of February. The female was mature with 3 shell-eggs in the uterus.

Dorylaimus eurydorys n. sp.

Pl. III. fig. 25, IV. fig. 30.

At Varde Aa I have taken a short-tailed *Dorylaimus* that, as far as I can see, not has been described before. Unfortunately I have not got a mature female and consequently the description can only be deficient. The only two specimens which have been taken

is a male of a length of 7 mm. and a young female measuring 4,6 mm.

The front end tapers considerably and the head-like part is distinctly marked by a sharp constriction. The mouth is surrounded by 6, nearly globular lips each of which is provided with two rather prominent papillæ one superior and one inferior. Very characteristic is the spear which has a considerable width in its proximal end; it is rather short, narrowing quickly towards the apex. The oesophagus is slender in its distal third and increases evenly in width. The tail which has the same shape in both sexes is very short, conical with rounded end. In the young female the ovary is just laid down; from its position the future place of the vulva can be nearly judged to a little behind the middle of the body. — There are 17 preanal papillæ in the male arranged in five sets of 7, 3, 3, 3, and one quite near the anus. The spicules are rather large, slightly curved, thickest in the middle and provided with two longitudinal lists; accessory pieces small and pointed in their proximal end.

The two specimens were collected near the bank of Varde Aa; they were very sluggish in their movements.

Dorylaimus rhopalocercus de Man.

1884. De Man, p. 169. T. XXVII. fig. 111.

This form has been collected on a meadow near Hellerup on roots of Bellis. De Man indicates that the species lives in „die feuchte Erde unserer Wiesen und Marschgründe".

Dorylaimus Carteri Bastian.

1865. Bastian, p. 106, Pl. IX. fig. 38—40.

1884. De Man, p. 177. T. XXIX. fig. 122.

It belongs to de Man's „omnivage Arten". It was collected in Lyngby Mose, in moss; in Dyrehaven, near the Fuglesangssø where it was taken in mud on roots of plants; in Dyrehaven near Springforbi and in Ordrup Mose. In Jutland it was taken in

a pond near Lønne at Nørre Nebel and in the extensive bogs between Hulsig and Kandestederne.

Dorylaimus acuticauda de Man.

1884. De Man, p. 179. T. XXX. fig. 124.

Several specimens were collected, both sexes, in Nymindegab opposite to the mouth of the Ringkøbing Fjord. A little strand-meadow is found here at the foot of the dunes covered with grass and Armeria. On the roots of these plants it was found. The Danish specimens appear to be a little larger than those described by de Man.

Zeiss Okularmikrom. A. Oc. 2.

Length 145 = 2,3 mm.

Oes. 33.

Vulva 71.

Tail 5.

Width 4.

De Man's formula gives: $\alpha = 36$, $\beta = 4^1/_2$, $\gamma = 29$.

De Man indicates: $\alpha = 23—25$, $\beta = 4$, $\gamma = 30—35$.

Dorylaimus tenuis n. sp.

Pl. V. figs. 39, 40, 42, 43, 46.

A very singular form belonging to this genus has been collected in Lyngby Sø. It occurs in mud on the roots of Stratiotes aloides. Several specimens were taken in the month of August both mature males and females, but none of the females contained shell-eggs in the uterus. Evidently the eggs had been newly laid as proved by the distension of the uterus (fig. 43). The shape of the animal is exceedingly thin, having almost the same width from head to tail. Only the front-end tapers rather quickly. The head s rounded, devoid of lips. Just behind the mouth occurs a ring-shaped thickening of the chitin-intima in which the spear moves. This is of the well-known usual shape and rather strong. The chitin-intima of the oesophagus is rather conspicuous. The distal

three quarters of the oesophagus are thin, from the beginning of the last fourth part it increases quickly. The vulva is placed a little before the middle of the body; the ante- and postvaginal part stand in the relation as 36 to 57. The tail is conical, pointed and its distal third is ventrally bent, forming a right angle with the proximal part. The female organ is bifid, the ovaries are relatively small; the uterus being rather spacious appears to be able to contain a considerable number of eggs. The hind part of the body of the male is ventrally bent. The number of the papillæ is nineteen, the hindmost is placed close before the anus, the space between the last four is twice the space between the others. The spicules are short, thick and provided with two longitudinal lists: the proximal end of the former is globular and no accessory pieces are seen (fig. 40).

The movements of the animal are exceedingly sluggish.

Zeiss Okularmikrom. A. Oc. 2.

Female:	Male:
Length 372 = 6 mm.	Length 287 = 4.6 mm.
Oes. 24.	Oes. 22.
Vulva 144.	Tail 8.
Tail 10.	Width 3.
Width 4.	

The formula of de Man gives $\begin{cases} \varphi.\ \alpha = 93,\ \beta = 15^1/_2,\ \gamma = 37. \\ \sigma.\ \alpha = 96,\ \beta = 13\ \ ,\ \gamma = 36. \end{cases}$

Dorylaimus stagnalis Dujardin.

1845. Dujardin, p. 231, T. III. fig. c.
1865. Bastian, p. 106, Pl. IX. fig. 35—37
1873. Bütschli, p. 27, T. I. fig. 4 a—d.
1876. — p. 379, T. XXV. fig. 13 a—c.
1884. De Man, p. 186, T. XXXII. fig. 132.
1907. — p. 17, T. II & III. fig. 5.

As might well be expected this species is widely distributed in this country. It is not confined to the larger basins as lakes

and rivers but occurs in the smallest pools and ditches; moreover it has been taken in bogs in damp moss. On Sjælland it has been collected in Lyngby Mose, in Ordrup Mose, in Brønshøj Mose; at the Fuglesangssø in Dyrehaven together with *Ironus ignavus*; on the "Eremitageslette" near Springforbi and at the Furesø on roots of plants in the edge of the water. Moreover it has been collected on Langeland in a little pool in a garden. In Jutland it has been taken in a very ferruginous ditch between Skagen and Gammelskagen and in the bogs between Hulsig and Kandestederne. The male has only been taken once, namely in the Furesø, in a rather considerable number.

Dorylaimus Bastiani Bütschli.

1873. Bütschli, p. 29, T. I. fig. 3 a—b.

1884. De Man, p. 185. T. XXXI. fig. 131.

It was only taken once, in the bogs between Hulsig and Kandestederne, near Skagen.

Dorylaimus longicaudatus Bütschli.

1874. Bütschli, p. 20.

1884. De Man, p. 189, T. XXXIII. fig. 136.

Of the two very longtailed species this was collected most frequently. I can say nothing about its distribution in this country all the localities being in the surroundings of Copenhagen; it has been collected in „Vintappergaardens Mose"; at the Fuglesangssø in Dyrehaven, on roots of plants; in the Kildeskov and in Dyrehaven, near Springforbi. Males and females occur with the same frequency.

Dorylaimus brigdammensis de Man.

1884. De Man, p. 188, T. XXXII. fig. 135.

It was collected in Ordrup Mose, on roots of plants, both sexes.

Dorylaimus macrolaimus de Man.

Pl. IV. fig. 38, Pl. V. figs. 41, 44, 45, 47, 48.

1884. De Man, p. 191, T. XXXIII. fig. 138.

v. Daday, p. 125, T. XIV. fig. 12.

1907. De Man, p. 20.

This species, established by de Man in 1884 and later only collected by Daday in Hungary and by de Man near Meudon in France, has proved to be one of the most common Dorylaimi in Denmark and widely distributed in this country. On account of the presumed scarceness of the animal and in spite of its appearance being very characteristic I sent my first specimens to Dr. de Man asking his opinion, and he affirmed the correctness of my determination. In this country the species has been taken in the following localities: The first specimens were collected in Lynæs in a bog near the plantation and in a little pool behind the church. Then it was taken in Lyngby Mose where it occurs abundantly in the Sphagnum; moreover in Lyngby Sø itself in mud on the roots of Stratiotes together with *D. tenuis*. At the Furesø it has been collected among plants in the edge of the water together with *D. stagnalis*. On Langeland it has been taken in a pool on roots of plants. Finally I have one specimen from Jutland, a male taken on roots of plants near the bank of Varde Aa.

The species seems to vary within rather wide limits both as to largeness and — as can be seen by the noted measurements — with respect to the relative proportions. A female from Lyngby Sø with seven eggs in the uterus has a length of 2,8 mm; a female from the Furesø still without eggs in the uterus measures 4,0 mm. De Man notes for the female 4,5 mm; I have met with no specimens of that length. A male from Lynæs measures 2,04 mm in length, de Man's male had the length of 3,7 mm.

With respect to the male I have made a rather interesting observation which might perhaps prove to apply to other species,

f. i. *D. stagnalis* and perhaps to other genera too, in which the tail of the male is different from that of the female. In the month of June a male in moult was taken at the Furesø; the animal had the appearance of a female with long pointed tail, but the old cuticula contained a fully developed male with the tail rounded and with spicules and preanal papillæ. I give a figure of my preparation of this specimen (fig. 38); it proves that the young male has the shape of a female till maturation.

The number of the papillæ is varying individually in the male. De Man indicates 19 for his male; the same number I count in the above named male from Varde Aa; on the young male, still inclosed in the larval skin is seen 15; on a male from Lynæs I count 17; in another, abnormally having the papillæ arranged in groups I count 18. This specimen is figured (fig. 48).

As to the front part of the animal I do not find the Danish specimens agreeing perfectly with the figure and description of de Man; he writes: „Die Kopfregion ist abgesetzt, niedrig, scheibenförmig". In the Danish specimens the front end is more rounded and the constriction behind the „head" not so strongly marked.

Zeiss Okularmikrom. A. Oc. 2.

♀ with 7 eggs in the uterus.	♀ without eggs.	♂ from Lynæs.
Length 175 = 2,83 mm.	Length 247 = 4,00 mm.	Length 126 = 2,04 mm.
Oes. 40.	Oes. 52.	Oes. 42.
Vulva 85.	Vulva 127.	Tail 2.
Tail 10.	Tail 16.	Width 3.
Width 4.	Width 4.	
$\alpha = 44$	$\alpha = 62$	$\alpha = 42$
$\beta = 4^1/_2$	$\beta = 4^1/_2$	$\beta = 3$
$\gamma = 17^1/_2$	$\gamma = 15^1/_2$	$\gamma = 63$

Dorylaimus doryuris n. sp.

Pl. III. figs. 28, IV. fig. 29, 31.

On account of the peculiar form of the tail I have named this species D. doryuris. It has some resemblance with *D. Carteri*: there is also a resemblance with the form *centrocercus*, but in the form of the tail it is different from both of these and does not resemble any of the species of this genus which I know. It seems to be not uncommon in this country as it has been taken in rather different localities: in Lynæs on roots of plants near the harbour: in Kildeskoven among putrefying leaves and finally at the Furesø in the edge of the water on roots of plants. The male was not seen.

The body is slender, tapering rather quickly towards the front end; this is inconspicuously head-shaped, provided with little prominent lips each of which carries two inconsiderable papillæ. The spear is of the usual form and rather strong; two ring-shaped thickenings of the chitin-intima are seen. The oesophagus being slender in the distal half increases evenly and is in its proximal end provided with a thickening resembling an inconspicuous bulbus. On the limit between oesophagus and intestine is found a strongly marked constriction. The cells of the intestine contain dark refractive granules, arranged in groups. The tail is domical and provided with a rather quickly narrowing pointed spine inconspicuously bent towards the vent (fig. 29). Vulva is placed nearly in the middle of the body, often a little before, at times a little behind. The female organ is bifid; the antevaginal ovary is to its bending longer than the postvaginal. Four eggs are seen in the uterus. The animal appears to produce eggs all the year round.

I give the measurements for three females; the numbers 1 and 2 originate from Lynæs, the number 3 was taken in the Kildeskov.

Zeiss Okularmikrom. A. Oc. 2.

1) Length 136 = 2,2 mm.	2) Length 142 = 2,3 mm.	3) Length 102 = 1,6 mm.
Oes. 31.	Oes. 31.	Oes. 17.
Vulva 63.	Vulva 65.	Vulva 59.
Tail 5.	Tail 6.	Tail 4.
Width 4.	Width 5.	Width 3.
$\alpha = 34$	$\alpha = 28$	$\alpha = 34$
$\beta = 4^1/_2$	$\beta = 4^1/_2$	$\beta = 6$
$\gamma = 27$	$\gamma = 24$	$\gamma = 25^1/_2$

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Explanation of Plates.

Zeiss' Microscope was used.

Pl. II.

Figs.

1. Rhabditis marina, Bastian, ♂: tail in profile. Apochr. 8 mm, Comp. 8,
2. Rhabditis marina, Bastian, ♂; tail from the dorsum. Apochr. 8 mm. Comp. 8.
3. Rhabditis marina, Bastian, ♂; spicules. Homog. Imm. 1/12 Oc. 2.
4. Rhabditis marina, Bastian, ♀; female organs. Apochr. 8 mm, Comp. 4.
5. Rhabditis marina, Bastian, ♀; front part. Apochr. 8 mm, Comp. 8.
6. Mononchus dolichurus, n. sp. ♀; front part. Apochr. 8 mm. Comp. 8.
7. Rhabditis marina, Bastian, ♀; tail. Obj. E, Oc. 2.
8. Oncholaimus oxyuris, n. sp. ♀; female organs. Apochr. 8 mm, Comp. 4.
9. Oncholaimus oxyuris, n. sp. ♂; tail. Apochr. 8 mm, Comp. 8.
10. Mononchus dolichurus, n. sp. ♀; tail. Apochr. 8 mm, Comp. 4.
11. Mononchus dolichurus, n. sp. ♀; limit between the oesophagus and the intestine. Apochr. 8 mm, Comp. 4.
12. Oncholaimus oxyuris, n. sp. ♀; head. Obj. E. Oc. 2.
13. Oncholaimus oxyuris, n. sp. ♀; tail. Apochr. 8 mm, Domp. 8.

Pl. III.

14. Monohystera crassissima, n. sp. ♀: hind part of the animal. Apochr. 8 mm, Comp. 4.
15. Monohystera crassissima, n. sp., ♂; spicules. Homog. Imm. 1/12 Oc. 2.
16. Trilobus gracilis, Bastian, ♀; tail with masculine papillæ. Apochr. 8 mm, Comp. 4.
17. Mononchus spectabilis n. sp., ♀; head. Apochr. 3 mm, Comp. 4.
18. Prismatolaimus dolichurus, de Man. Limit between the oesophagus and the intestine. After a sketch in my notes.
19. Mononchus spectabilis, n. sp., ♂: tail. Apochr. 8 mm, Comp. 8.
20. Trilobus gracilis, Bastian, ♀; the female organs from the specimen in which are found preanal masculine papillæ. Apochr. 8 mm, Comp. 4.
21. Cylindrolaimus tristis n. sp., ♀; head. Apochr. 3 mm, Comp.4.
22. Monohystera crassissima n. sp., ♀; head. Homog. Imm. 1/12 Oc. 2.
23. Cylindrolaimus tristis, n. sp., ♀; tail. Apochr. 8 mm, Comp. 8.
24. Dorylaimus doryuris, n. sp., ♀: head. Apochr. Homog. Imm. 2 mm, Comp. 4.
25. Dorylaimus eurydorys, n. sp., ♀: head. Apochr. 8 mm, Comp. 8.

Figs.

26. Cylindrolaimus tristis, n. sp., ♀: female organs. Apochr. 8 mm. Comp. 8.
27. Mononchus spectabilis, n. sp., ♀: female organs. Apochr. 8 mm. Comp. 4.
28. Mononchus spectabilis, n. sp., ♀: tail. Apochr. 8 mm, Comp. 8.

Pl IV.

29. Dorylaimus doryuris, n. sp., ♀: tail. Apochr. 8 mm, Comp. 8.
30. Dorylaimus eurydorys, n. sp., ♂; tail. Apochr. 8 mm, Comp. 4.
31. Dorylaimus doryuris, n. sp., ♀: female organs. Apochr. 8 mm, Comp. 8.
32. Spilophora geophila, de Man, ♂; front part; Obj. E. Oc. 3.
33. Ironus ignavus Bastian; the musculature of the utero-vaginal-apparatus. Apochr. 8 mm, Comp. 8.
34. Spilophora geophila, de Man, ♂; tail. Obj. E. Oc. 3.
35. Chromadora Örleyi, de Man, ♂; tail. Obj. E, Oc. 3.
36. Mononchus spectabilis, n. sp., ♂: the spicules and their surroundings. Homog. Imm. $^1/_{12}$ Oc. 2.
37. Chromadora Örleyi, de Man, ♀; front part. Obj. E. Oc. 3.
38. Dorylaimus macrolaimus, de Man: Young male in moult. Hind part of the animal. Apochr. 8 mm, Comp. 8.

Pl. V.

39. Dorylaimus tenuis, n. sp., ♀; tail. Apochr. 8 mm, Comp. 8.
40. Dorylaimus tenuis, n. sp., ♂; hind part of the animal. Apochr. 8 mm. Comp. 8.
41. Dorylaimus macrolaimus de Man, ♂; hind part of the animal, Obj. E. Oc. 2.
42. Dorylaimus tenuis, n. sp., ♀: head. Homog. Imm. $^1/_{12}$. Oc. 2.
43. Dorylaimus tenuis, n. sp., ♀: female organs. Obj. A. Oc. 3.
44. Dorylaimus macrolaimus, de Man, ♀; female organs. Apochr. 8 mm. Comp. 4.
45. Dorylaimus macrolaimus, de Man, ♀. Homog. Imm. $^1/_{12}$. Oc. 2.
46. Dorylaimus tenuis, n. sp., ♀; vulva. Apochr. 8, Comp. 8.
47. Dorylaimus macrolaimus, de Man, ♀; tail. Apochr. 8 mm, Comp. 4.
48. Dorylaimus macrolaimus, de Man; hind part of an abnormal male with the papillæ arranged in groups. (This figure shows two longitudinal lists instead of one; it is the list of the underlying spicule which has been erroneously placed here.)

23.—10.—1911.

Astrochalcis micropus n. sp.
A new Euryalid from the Philippines.

Preliminary Notice

by

Dr. ***Th. Mortensen.***

After having described only two months ago a new species of the genus *Astroclon, A. Suensoni* Mrtsn., found in a collection received from Captain E. Suenson, I was very agreably surprised, on receiving a new collection from Captain Suenson (from San Bernardino Strait, Philippines), to find therein a Euryalid which at once appeared to me to represent quite a new type. On a closer study I found it to be really a hitherto unknown species, apparently nearest related to *Astrochalcis tuberculosus* Koehler among the Euryalids made known as yet. Whether it really belongs to this genus may certainly be somewhat disputable. I shall not, however, at present establish a new genus for it, leaving the discussion of this question for the full report on this species and the other recently published new form *Astroclon Suensoni.*

Diameter of disk 60 mm, width of arms near the disk 25—28 mm, height at the same point ca. 10 mm.

The mouth-angles carry rather close set spiniform papillæ which increase in size towards the apex, where a bunch of about a dozen coarser teeth are found, arranged in 2—3 irregular, vertical rows. The mouth-angles are somewhat raised in the middle, appearing as five warts round the mouth.

The single madreporic plate is situated outside the very wide mouth frame, on the short, nearly vertical edge connecting the ventral and the dorsal side. In this part are also found the short genital slits; neither can be seen from the ventral side.

The whole animal, both disk and arms, is covered by a fine, uniform granulation, which gives the skin quite a leatherlike appearance. No larger tubercles occur, either on the disk or the arms. On the under side of the disk the grains are slightly larger. The radial shields form very broad ridges, separated only by quite narrow sunk lines; the whole dorsal side of the disk thus somewhat resembles a great flower with ten large, flat petals. The disk passes rather evenly into the dorsal side of the arms, the radial shields being only slightly elevated at their outer edge. The limit between disk and arms is, however, more distinct than in *A. tuberculosus*.

The arms are exceedingly broad and robust, and the distances between the forkings are very short. The angles between the branches are sometimes nearly right, which results in the arms partly covering one another, for want of room. They are upon the whole low and rather flattened; the underside is flat, slightly hollowed along the middle line, the upper side is rounded. The outer branchlets are fine and of the usual Euryalid appearance; they may begin from about the 6th forking. Some of the arms, however, have no such fine twigs at all, the tips of the branches being quite short and involuted. This is the case not only in such arms which are evidently regenerated and not yet fully grown out, but also in arms which show no trace of being regenerated and are as long as those with the fine twigs. In the same arm one main branch may end in the fine branchlets, while the other has the tips stout and involuted — even in the same main branch both forms may occur. This peculiar dimorphism of the arms thus appears to be a normal character of this species.

The first forking is close to the edge of the disk, at the 7th-8th joint. The first branches are very short, only 10-20 mm

long, comprising only ca. 7 joints. From the 3rd forking a slight difference in the length of the branches begins; thus in one branch they are respectively 13 and 8 mm long, in another 12 and 16 mm. Farther out the size of the branches becomes very unequal, so that there comes to be one main stem with smaller, rather regularly alternating side branches.

The rings of hooklets are found only on the outer branches, beginning from about the 8th forking. They are double.

A most conspicuous feature of this species is that the tube-feet have totally disappeared on the inner 6—7 forkings. From the 7th—8th forking they appear, but are very fine, evidently rudimentary. On the outer branchlets they are comparatively a little larger, though always very fine. The papillæ begin also at the 7th—8th forking, to the number of two, then increasing to 3 and 4; on the outer branchlets the number decreases again, and at last there is only one. They are only small and inconspicuous hooks. The very small pores can be traced a little farther in on the arms than the papillæ. They are situated on the edge of the arms. Along the middle of the arms is seen a double series of small, paired, translucent spaces, from the mouth-edge to the outer branches, through about the 8 first forkings, resembling tentacle pores. They are, however, closed and have nothing to do with the pores; they represent spaces between the vertebræ, as known also in some other Euryalids.

Two of the arms are broken close to the disk, at the first forking. Each of them has begun to regenerate, but only one branch has been formed as yet on each of them.

The specimen was taken in San Bernardino Strait, 12° 27′ N. 124° 3′ E. in 50—100 fathoms, on the 3. 8. 1911.

3. I. 1912.

Ascidien aus dem Skagerrak. dem Trondhjemsfjord und von den Fär Öer.

von

R. Hartmeyer,
Berlin.

Das dieser Arbeit zu Grunde liegende Material ist von Herrn Dr. Th. Mortensen gesammelt worden, und zwar teils auf den Fahrten des „Thor“ im Skagerrak und in der nördlichen Nordsee, teils im Trondhjemsfjord, im Sommer 1911, teils endlich bei der Insel Nolsö (Fär Öer) im Jahre 1899. Die Collection besteht insgesamt — von einigen unbestimmt gebliebenen *Botryllidae* abgesehen — aus 26 Arten und beansprucht in erster Linie tiergeographisches Interesse.

Ueber die Ascidien des Trondhjemsfjordes hat Herdman[1]) nach den Sammlungen des Rev. Canon Norman bereits eine Arbeit veröffentlicht, welche 13 Arten (darunter 3 nur bis zur Gattung bestimmte) enthält. Es sind dies folgende:

Molgula eugyroides, Traustedt... = *Caesira eugyroides* (Traust.).
Polycarpa pomaria, Sav. (?).... = *Pandocia pomaria* (Sav.).
— *pusilla*, Herdman .... = — *pusilla* (Herdm.).
Ascidia compressa, O. F. Müll.... = *Phallusia obliqua* (Ald.).
— *plebeia*, Alder ..... = — *conchilega* (Müll.).
Ascidiella venosa, O. F. Müll..... = — *virginea* (Müll).
— , sp.
Ciona intestinalis, Linn..... = *Ciona intestinalis* (L.).

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[1]) Ann. nat. hist., ser. 6, v. 12. p. 443. 1893.

Corella parallelogramma, O.F.Müll. = *Corella parallelogramma*(Müll.).
Leptoclinum tenue, Herdman .... = *Didemnum tenue*, (Herdm.).
Amaroucium pomum, M. Sars (?) = *Macroclinum pomum* (Sars).
Psammaplidium, sp. n. .....?? = *Aplidium* aff. *spitzbergense* (Hartmr.).
Aplidium, sp. .....? = *Aplidium pallidum* (Verr.).

Von den bestimmten Arten dieser Liste fehlt nur *Ciona intestinalis* in der Ausbeute von Mortensen. Die von Herdman als *Psammaplidium*, sp. n. bezeichnete Form ist vielleicht das *Aplidium* aff. *spitzbergense* meiner Liste, sein *Aplidium* sp. vermutlich *Aplidium pallidum*. Ob seine *Ascidiella* sp. zu *Ascidiella aspersa* gehört, lässt sich natürlich nicht entscheiden. Dass letztere Art auch im Trondhjemsfjord vorkommt, halte ich für sehr wahrscheinlich, wenngleich sie auch unter meinem Material nicht vertreten ist. Vielleicht bleibt sie auf die obere Litoralzone beschränkt, während mein Material ausnahmslos aus Tiefen von 150—300 m stammt. Ausser diesen von Herdman erwähnten Arten enthält die Ausbeute von Mortensen noch 5 Arten, die bisher aus dem Trondhjemsfjord nicht oder doch nicht sicher nachgewiesen waren, nämlich: *Tethyum loveni* (Sars), *Dendrodoa grossularia* (Bened.), *Leptoclinides faeröensis* Bjerk., *Aplidium pallidum* (Verr.) und *Aplidium* aff. *spitzbergense* Hartmr.

Im Skagerrak und zwar im Bereich der norwegischen Rinne, in Tiefen von 108—660 m, wurden 7 Arten erbeutet, nämlich; *Caesira eugyroides* (Traust.), *Tethyum mortenseni* n. sp., *Dendrodoa grossularia* (Bened.), *Pandocia pomaria* (Sav.), *Phallusia obliqua* (Ald.), *Phallusia conchilega* (Müll.) und *Ciona intestinalis* (L.). Besonders interessiert von dieser Liste die neue Art *Tethyum mortenseni*, die in einem Exemplar zusammen mit *Dendrodoa grossularia* (Bened.) erbeutet wurde. Neuerdings hat Van Name, wie er mir brieflich mitteilt, diese Art bei Neu Schottland wiedergefunden.

Die Ausbeute von den Fär Öer — das Material wurde am Nordende von Nolsö in einer Tiefe von etwa 100 Fad. gesammelt —

umfasst 17 Arten, nämlich: **Caesira tenax* (Traust.), **Caesira septentrionalis* (Traust.), *Pyura echinata* (L.), *Tethyum rusticum* (L.), **Tethyum loveni* (Sars), **Dendrodoa grossularia* (Bened.), *Dendrodoa aggregata* (Rathke), *Pandocia pomaria* (Sav.), **Polycyclus lamarcki* (Herdm.), **Phallusia conchilega* (Müll.), **Ascidiella aspersa* (Müll.), *Ciona intestinalis* (L.), **Didemnum albidum* (Verr.), *Macroclinum pomum* (Sars), **Aplidium pallidum* (Verr.), **Sidnyum turbinatum* Sav., **Synoicum incrustatum* (Sars). Von diesen sind nicht weniger als 11 Arten neu für die Fär Öer. Dieselben sind durch einen* kenntlich gemacht. Ueberdies wurden von den 14 aus dem Bereiche der Fär Öer bekannten Arten [1]) 6 wieder gesammelt, sodass die Ascidienfauna dieser Inselgruppe und ihrer näheren Umgebung jetzt auf 25 Arten, also fast die doppelte Zahl, gestiegen ist. Tiergeographisch besonders interessant ist der Umstamd, dass auch durch die neu nachgewiesenen Arten den Fär Öer der Character eines arktisch-subarktischen Mischgebietes in ausgesprochenem Masse gewahrt bleibt. Die Liste der arktischen Arten vermehrt sich um *Caesira tenax*, *Caesira septentrionalis*, *Didemnum albidum* und *Synoicum incrustatum*, die der subarktischen um *Polycyclus lamarcki*, *Phallusia conchilega*, *Ascidiella aspersa* und *Sidnyum turbinatum*. Die übrigen für die Fär Öer neuen Arten sind dem arktischen und subarktischen Gebiete mehr oder weniger gemeinsam.

Fam. ***Caesiridae [Molgulidae].***

Caesira [Molgula] tenax (Traust.).

1903 *Molgula tenax*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 137, t. 4, f. 3, t. 7, f. 4—9.

Fundnotiz: Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad., 14. VI. 1899. Th. Mortensen. 1 Exemplar.

Das vorliegende Exemplar zeigt die Artmerkmale in typischer Weise, sodass ich meiner früheren Beschreibung nichts hinzuzufügen

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[1]) Vgl. Hartmeyer in: Bronn, Klass. Ordn. Thierr., v. 3 suppl., p. 1576 u. 1586. 1910.

habe. Neu ist nur die Thatsache, dass auch bei dieser Art Brutpflege vorkommt. Der Peribranchialraum des Tieres war nämlich mit geschwänzten Larven angefüllt, allerdings in nicht besonders beträchtlicher Zahl.

Verbreitung: Die bisher nur aus der Hocharktis bekannte Art ist nunmehr auch für die Får Öer nachgewiesen und erreicht damit das Grenzgebiet zwischen Arktis und Subarktis. Ihre Verbreitung in der Arktis ist immer noch sehr discontinuierlich und beschränkt sich auf West-Grönland, Spitzbergen und die Bären-Insel. Wahrscheinlich ist die kleine unscheinbare Form meist von den Sammlern übersehen worden.

Caesira [Molgula] septentrionalis (Traust.).

1903 *Molgula septentrionalis*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 152, t. 4, f. 7 u. 8, t. 7, f. 12—16, t. 8, f. 1.

Fundnotiz: Får Öer, Tief am Nordende von Nolsö, ca. 100 Fad., 14. VI. 1899. Th. Mortensen. Zwei erwachsene, ein junges Exemplar.

Die beiden erwachsenen Exemplare sind mit groben Schalentrümmern und anderen Fremdkörpern, wie es für diese Art characteristisch ist, dicht bedeckt. Das Flimmerorgan ist hufeisenförmig, die beiden Schenkel nicht eingerollt. Die Kiemenspalten sind typisch, meist kurz und wenig gebogen. Die Gonaden, besonders die der rechten Seite, sind mächtig entwickelt. Bei dem jungen Tier ist das Flimmerorgan einfach halbmondförmig und wie gewönhlich mit der concaven Seite nach hinten und etwas nach links gewandt.

Verbreitung: Auch diese Art ist für die Får Öer neu. Wie die vorige Art muss sie ebenfalls als hocharktische betrachtet werden, die aber im Gegensatz zu *Caesira tenax* an der norwegischen Küste südlich bis Bergen nachgewiesen ist. Ihr zur Zeit bekanntes Verbreitungsgebiet umfasst Spitzbergen, die norwegische Küste einschlieslich der Murmanküste und des weissen Meeres, sowie West- und Ost-Grönland.

Caesira [Molgula] eugyroides (Traust.).

1883 *Molgula eugyroides*, Traustedt in: Vid. Meddel., ann. 1882, p. 112.

1893 *M. e.*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 443.

Fundnotiz: Skagerrak, 53 Seemeil. n. von Hanstholm, 526 m. 23. VI. 1911. „Thor" Stat. 1570. Th. Mortensen. 1 Exemplar.

Vor Tautra (Trondhjemsfjord), ca. 200 m. 31. VII. 1911. Th. Mortensen. 1 Exemplar.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. 4 Exemplare.

In ihren äusseren Merkmalen stimmen die Stücke durchaus mit der Beschreibung Traustedt's überein. Nur das Exemplar von Tautra ist durch eine mehr cylindrische Gestalt ausgezeichnet. Auch ist es nicht so stark mit Sand bedeckt und ist überdies nicht frei, sondern auf einer *Pandocia pomaria* (Sav.) festgewachsen. Die Form der Darmschlinge stimmt bei meinen Exemplaren mit Traustedt's Abbildung überein. Dagegen ist die Lage der linken Gonade ein wenig abweichend. Sie ist von halbmondförmiger Gestalt, die convexe Seite der Egestions-Öffnung zugewandt, und liegt in der Hauptsache in der zweiten Darmschlinge. Bei einem Exemplar von Rödberg ist sie dem absteigenden Darmschenkel mit beiden Enden dicht angelagert (Fig. 1), bei dem Exemplar von Tautra demselben sogar fast völlig aufgelagert (Fig. 2). Der Raum der ersten Darmschlinge war mit zahlreichen geschwänzten Larven angefüllt. Brutpflege war bei dieser Art meines Wissens noch nicht bekannt.

Fig. 1.

Fig. 2.

Verbreitung: Herdman hat diese durch Traustedt ursprünglich von Bahia beschriebene Art bereits bei Rödberg nachgewiesen. Ebensowenig wie Herdman zweifle ich daran, dass meine Stücke aus dem Trondhjemsfjord dieser Art zugehören, sodass die Thatsache dieser beiden weit getrennten Fundorte bestehen bleibt.

Fam. *Pyuridae [Halocynthiidae].*

Pyura [Halocynthia] echinata (L.).

1910 *Pyura echinata*, Hartmeyer in: S. B. Ges. naturf. Fr. Berlin, ann. 1910, p. 231, t. 8.

Fundnotiz: Får Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 5 Exemplare.

Das Material enthält 3 kleine und 2 grössere Exemplare. Die Stacheln der ersteren sind wohl durchweg nach dem subarktischen Typus gebaut, die der letzteren dagegen teils nach dem subarktischen, teils nach dem arktischen Typus. Das grösste Exemplar ist 13 mm lang. Es besitzt links 6 Falten, rechts dagegen noch eine 7te rudimentäre. Falte 2 ist auf beiden Seiten sehr wenig entwickelt. Der Peribranchialraum war mit geschwänzten Larven in ungeheurer Anzahl angefüllt. Auch für diese Art fehlte meines Wissens bisher der Nachweis einer Brutpflege. Die Art war von den Får Öer bereits bekannt. Meine Exemplare stimmen in ihren anatomischen Besonderheiten durchaus mit den von mir früher beschriebenen Stücken von den Får Öer überein.

Fam. *Tethyidae [Styelidae].*

Tethyum [Styela] rusticum (L.).

1903 *Styela rustica*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 217, t. 5, f. 2 u. 3.

Fundnotiz: Får Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 7 Exemplare.

Das Material enthält sieben kleinere, 6—24 mm lange Exemplare, sämtlich mit kräftig entwickeltem Horn zwischen den Körperöffnungen. Auch die knötchenartigen Verdickungen der Querrunzeln sind bei dem nur 6 mm langen Exemplar bereits erkennbar, bei dem nächst kleinsten, 10 mm langen Exemplar wie auch bei allen anderen dagegen deutlich ausgeprägt. Ein achtes, 33 mm langes Exemplar ist hornlos.

Diese Art ist von den Fär Öer bereits durch Traustedt nachgewiesen.

Tethyum [Styela] loveni (Sars).

1903 *Styela loveni*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 209, t. 5, f. 4—6, t. 11, f. 6—9, Textf. 6—11.

1907 *Styela coriacea*, Alder u. Hancock, Brit. Tun., v. 2, p. 109, t. 37, f. 1—4, t. 39, f. 2 u. 3, t. 41, f. 4 u. 5.

1907 *Styela granulata*, Alder u. Hancock, Brit. Tun., v. 2, p. 115, t. 37, f. 8 u. 9, t. 39. f. 5 u. 6, t. 42, f. 10 u. 11, t. 48, f. 12, Textf. 65 u. 66.

Fundnotiz: Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad., 14. VI. 1899. Th. Mortensen. 3 Exemplare.

Vor Rödberg, Trondhjemsfjord, ca. 300 m, 27. VII. 1911. Th. Mortensen. 2 Exemplare.

Von Nolsö liegen drei junge Exemplare vor, die aber bereits alle auf die innere Anatomie bezüglichen Artmerkmale in characteristischer Weise zeigen. Das grösste von ihnen ist von länglich cylindrischer Gestalt und nur 8 mm lang. Die Oberfläche erscheint unter der Lupe fein gefeldert. Ein zweites ist beerenförmig und ganz glatt. Beide erinnern äusserlich an die Exemplare von Darserort (Fauna arctica, Textf. 7 u. t. 5, f. 5). Ein drittes ganz junges Tier sass auf einem von *Caesira septentrionalis* abgelösten Schalentrümmer.

Die beiden Stücke aus dem Trondhjemsfjord sind vollständig abgeflacht und mit Sand incrustiert.

Ich will bei dieser Gelegenheit bemerken, dass sowohl *Tethyum coriaceum* Ald. Hanc. (1848) als auch *Tethyum granulatum* Ald. (1863)[1]), die beide erst in dem nachgelassenen Werke von Alder und Hancock (1907) ausführlicher beschrieben und abgebildet werden, meines Erachtens mit *T. loveni* synonym sind. Aus den

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[1]) Eine *Cynthia granulosa*, die Pruvot (1901) ohne Autornamen von der catalonischen Küste erwähnt, hat nichts mit dieser Art, die sicher nicht im Mittelmeer vorkommt, zu thun.

ursprünglichen Diagnosen beider Arten kann auf diese Synonymie allerdings nicht geschlossen werden. Um so characteristischer sind dagegen die in der citierten Arbeit gegebenen Abbildungen, sodass an der Identität aller drei Arten nicht gezweifelt werden kann. Der Artname *loveni* wäre demnach durch *coriaceum* zu ersetzen, was ich mir aber für eine spätere Revisionsarbeit vorbehalte.

Auf Grund dieser Synonymie erweitert sich das Verbreitungsgebiet dieser Art über die Doggerbank (Alder, 1865) bis an die Küste von Northumberland und Durham (Alder u. Hancock, 1848) und zu den Shetland Inseln (Norman, 1869). Van Name hat die Art, wie er mir mitteilt, auch an der Ostküste von Nord-Amerika gefunden, was nach ihrer bisher bekannten Verbreitung (West-Grönland!) zu erwarten war.

Von den Fär Öer war die Art bisher auch noch nicht bekannt. Ebensowenig liegt eine specielle Angabe über ihr Vorkommen im Trondhjemsfjord vor, wenngleich sie nach Kiær (1893) ganz allgemein an der norwegischen Küste vorkommt.

Dagegen glaube ich, dass die Angaben über ihr Vorkommen bei den Kanal-Inseln (Ansted u. Latham, 1862; Koehler, 1885) und bei Falmouth (Cocks, 1850) auf irrtümlicher Bestimmung beruhen. Ich habe zu viel Material von der Südküste Englands und aus dem Kanal durchgesehen, ohne diese Art darunter gefunden zu haben, um diese Fundorte als verbürgt aufführen zu können.

Tethyum [Styela] mortenseni nov. spec.

Fundnotiz: Skagerrak, 58° 06′ N. 9° O., 660—420 m. 24. VI. 1911. „Thor“ Stat. 1571. Th. Mortensen. 1 Exemplar.

Äusseres.

Der Körper ist beerenförmig, ein wenig höher als lang, äusserlich am ehesten an gewisse Exemplare von *Dendrodoa grossularia* erinnernd. Die Länge beträgt 9 mm, die Höhe 11 mm. Die Körperöffnungen sind als kleine Wärzchen ohne weiteres erkennbar. Die Ingestionsöffnung ist deutlich vierlappig und liegt terminal, die Egestionsöffnung ist nur undeutlich gelappt und liegt

ein wenig tiefer. Die Entfernung von einander beträgt 4 mm. Das Tier war mit der Basis und einem Teile der linken Seite angeheftet. Der Cellulosemantel trägt im Bereiche der Anheftungsfläche eigenartige Haftfortsätze. Sonst ist die Oberfläche frei von Fremdkörpern — von einzelnen Sandkörnchen abgesehen — und bis auf einige offenbar postmortale Fältelungen glatt. Die Farbe ist bräunlich.

Innere Organisation.

Der Cellulosemantel ist sehr dünn, hautartig und schwach durchscheinend.

Die Zahl der Tentakel beträgt etwa 60. Sie lassen sich auf vier Grössen verteilen und sind, stellenweise wenigstens, regelmässig nach dem Schema 1 4 3 4 2 4 3 4 1 . . . angeordnet. Die Zahl der Tentakel 1. und 2. Ordn. beträgt demnach je 7, die 3. Ordn. 15 und die 4. Ordn. 30.

Das Flimmerorgan habe ich nicht deutlich erkannt. Es scheint ein ganz kleines, rudimentäres Gebilde zu sein, das wie bei den meisten anderen Tiefseeformen der Gattung wahrscheinlich eine einfach becherförmige Gestalt hat. Dagegen fällt das langgestreckte Ganglion durch seine relative Grösse auf.

Der Kiemensack ist dadurch besonders bemerkenswert, dass er jederseits nur eine typische Falte besitzt. Diese Falte entspricht der Falte 1 eines normalen Kiemensackes. Rechts beträgt die Zahl der inneren Längsgefässe der Falte etwa 16, während zwischen ihr und der Dorsalfalte 4 intermediäre innere Längsgefässe verlaufen. Es ist dabei allerdings zu berücksichtigen, dass eine scharfe Grenze zwischen intermediären inneren Längsgefässen und den auf der Falte verlaufenden Längsgefässen kaum zu ziehen ist und man das erste basale Gefäss der Falte ebensogut auch noch als intermediäres Gefäss ansprechen könnte. Links dagegen verlaufen zwischen Dorsalfalte und Falte 1 nur zwei Gefässe, welche Anspruch auf die Bezeichnung intermediärer Gefässe machen können, sodass die Falte der Dorsalfalte etwas näher liegt, während die Zahl der

auf der Falte verlaufenden Gefässe etwa 18 beträgt. Der gesamte übrige Kiemensack jederseits zwischen Falte 1 und Endostyl entbehrt jeder Faltenbildung. Er wird lediglich von inneren Längsgefässen durchzogen, die bald in etwas weiteren, bald in etwas näheren Abständen einander folgen. Rechts beträgt ihre Zahl etwa 34, links etwa 32. Das Schema für den Kiemensack würde demnach lauten:

rechts: D 4 (ca. 16) ca. 34 E.
links: D 2 (ca. 18) ca. 32 E.

Die Quergefässe lassen an manchen Partieen wesentliche Unterschiede in der Breite nicht erkennen, an anderen dagegen wechseln breitere mit schmäleren ab. Parastigmatische Quergefässe finden sich nur ganz gelegentlich. Die Felder enthalten meist 3 oder auch 4 längliche Kiemenspalten, die manchmal gewisse Unregelmässigkeiten in ihrer Gestalt, auch Verdoppelungen durch Querteilung innerhalb eines Feldes zeigen.

Die Dorsalfalte ist ein glatter und glattrandiger Saum, der nach der Einmündung des Oesophagus hin etwas an Höhe zunimmt. Nur an einer Stelle habe ich einen deutlichen dreieckigen Zahn auf dem freien, ein wenig nach rechts umgeschlagenen Rande festgestellt.

Der Darm bildet eine stark S-förmig gekrümmte Doppelschlinge und erinnert in gewisser Hinsicht rein äusserlich an den Darm mancher *Phallusia*-Arten. Der Oesophagus ist nur kurz, wenig gebogen und entspringt ganz an der Basis des Kiemensackes. Er liegt in seinem ganzen Verlaufe horizontal und ist deutlich gegen den Magen abgesetzt. Der Magen ist ziemlich lang, spindelförmig nnd fällt besonders durch seine genau senkrechte, d. h. parallel zum Endostyl gerichtete Lage auf. Im Innern trägt er Längsfalten, am Pylorus-Ende einen kurzen, kolbig angeschwollenen, nur wenig gekrümmten Blindsack. Der Mitteldarm wendet sich zunächst ein kurzes Stück nach der Ventralseite, um dann unter einem rechten Winkel zur Bildung der ersten Darmschlinge nach vorn zu verlaufen. Die erste Darmschlinge ist ziemlich lang und weit, aber vollständig geschlossen

indem der absteigende Darmschenkel bis an den Oesophagus herantritt. Die zweite Darmschlinge ist etwas kürzer, weniger weit und offen. Der After liegt beträchtlich tiefer, als die obere Krümmung der ersten Darmschlinge. Sein Rand war zerstört.

Die Zahl der Gonaden beträgt 3. Eine, die grösste, gehört der linken, die anderen beiden der rechten Seite an. Erstere folgt in ihrem Verlaufe dem absteigenden Aste der ersten Darmschlinge bis in das Lumen der zweiten Darmschlinge hinein, um dann mit ihrem Endstück kurz umzubiegen und in der Nähe des Afters auszumünden. Die anderen beiden verlaufen annähernd parallel, zunächst aus unmittelbarer Nähe des Endostyls schräge nach hinten, um dann in ähnlicher Weise wie die linke Gonade mit ihren Ausführgängen nach vorn umzubiegen. Die Gonaden sind hermaphroditisch. Das Ovarium nimmt die innere, dem Kiemensack anliegende Partie ein, der Hoden dagegen die äussere, dem Peribranchialraum zugewandte Seite. Er überlagert das Ovarium so vollständig, dass es von aussen überhaupt nicht sichtbar ist. Ei- und Samenleiter münden nebeneinander aus. Ersterer stellt einen trompetenartig erweiterten Gang, letzterer einen engen Kanal dar.

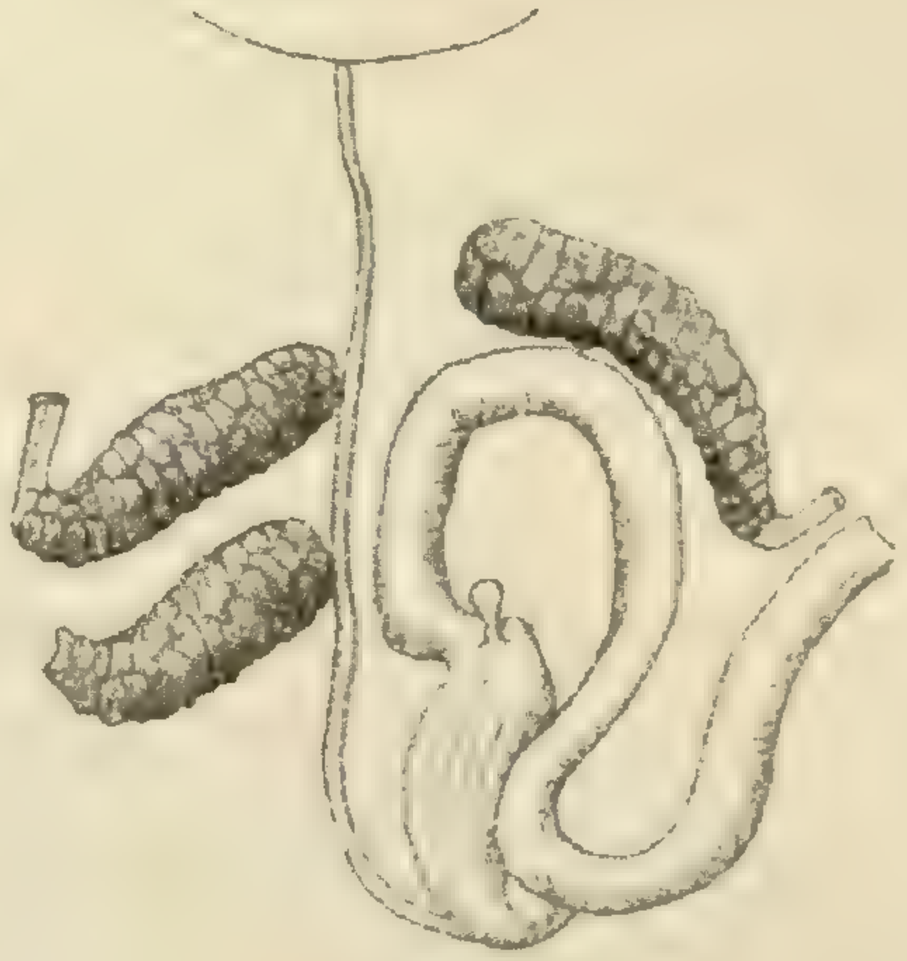

Fig. 3.

Erörterung.

Diese interessante kleine Form, die in Gemeinschaft mit einigen Exemplaren von *Dendrodoa grossularia* (Bened.) in der norwegischen Rinne in nicht unbeträchtlicher Tiefe leider nur in einem Exemplar erbeutet wurde, scheint bisher noch unbeschrieben zu sein. Es handelt sich zweifellos um eine echte *Tethyum*-Art, die wie die Mehrzahl der Tiefseeformen dieser Gattung Rückbildungserscheinungen im Bau des Kiemensackes zeigt. Bei keiner dieser Formen ist aber

der Rückbildungsprocess so weit vorgeschritten, dass nur noch eine Falte jederseits erhalten geblieben ist. Bei den drei vom „Challenger“ bei Buenos Ayres in 1080 m Tiefe erbeuteten Arten *T. flavum* (Herdm.), *T. glans* (Herdm.) und *T. oblongum* (Herdm.) sind zwar jederseits 4, aber bereits rudimentäre, d. h. nur durch Gruppen von inneren Längsgefässen gebildete Falten vorhanden. Eine dieser Arten besitzt eine gezähnte Dorsalfalte, ein Merkmal, das auch noch andere *Tethyum*-Arten der Tiefsee zeigen und das ja auch bei *T. mortenseni*, wenigstens in seinen ersten Anfängen, angedeutet zu sein scheint. Ueber Darm und Gonaden enthalten die Diagnosen leider keine Angaben. Zwei weitere vom „Challenger“ im Süden von Australien in der bedeutenden Tiefe von 4680 m erbeutete Arten, *T. squamosum* (Herdm.) und *T. bythium* (Herdm.) sind ebenfalls gut unterschieden. Erstere Art besitzt u. a. jederseits 2 deutliche Falten, letztere ist besonders durch ihre gezähnte Dorsalfalte ausgezeichnet und besitzt überdies jederseits 4 Falten. *T. sericatum* (Herdm.), auch aus dem südlichen Indic, aus 3510 m Tiefe, besitzt jederseits nur eine Gonade, und endlich *T. pusillum* (Herdm.), aus dem nördlichen Pacific, aus 3090 m Tiefe besitzt jederseits mehrere Falten. Die Beschreibung ist im übrigen äusserst kurz gehalten und enthält keinerlei Angaben über Dorsalfalte, Darm und Gonaden. Die Tentakelzahl wird als gering bezeichnet. In den äusseren Merkmalen besteht eine gewisse Ähnlichkeit. Zu diesen 7 Challenger-Arten kommen noch 5 weitere, von anderen Expeditionen erbeutete Arten hinzu. Das von der Norske Nordhavs Exp. in 2195 m Tiefe zwischen Grönland und Spitzbergen erbeutete *T. bathybium* (Bonnevie) ist ohne weiteres durch den Bau der Gonaden, des Kiemensackes und der Dorsalfalte unterschieden. Eine zweite von dieser Expedition gesammelte Art, *T. doliolum* (Bjerk), kommt ebensowenig in Betracht, da sie 4 Falten und jederseits nur 1 Gonade besitzt. Es verbleiben noch *T. milleri* (Ritt.) vom „Albatross“ an der californischen Küste in 4010 m Tiefe gesammelt, mit 4 Falten und 1 Gonade jederseits, *T. braueri* (Mchlsn.), von der „Valdivia“ bei Sumatra in 750 m Tiefe erbeutet, mit denselben unterscheidenden Merkmalen und

T. profundum (Sluit.), von der „Siboga“ im mal. Archipel in 959 m Tiefe gefangen, die im Verlauf des Darmes und der Lage der linken Gonade gewisse Ähnlichkeiten zeigt, aber rechts auch nur 1 Gonade besitzt und überdies jederseits 3 rudimentäre Falten. Es lässt sich die neue Art demnach von allen aus der Tiefsee bekannt gewordenen Arten ihrer Gattung durch genügende Merkmale unterscheiden, zu denen in erster Linie die eine nur erhalten gebliebene Falte und, soveit die Diagnosen darüber Angaben erhalten, die Zweizahl der Gonaden auf der rechten Seite gehören. Wie weit alle diese Tiefseeformen einer vorwiegend litoralen Gattung, die aber wie keine zweite litorale Gattung auch in der Tiefsee vertreten ist und hier ihrer Artenzahl nach auch alle eigentlichen Tiefseegattungen, mit Ausnahme von *Culeolus*, übertrifft, untereinander oder zu litoralen Arten nähere verwandtschaftliche Beziehungen zeigen, lässt sich zur Zeit noch nicht übersehen.

Dendrodoa grossularia (Bened.).

1903 *Styelopsis grossularia*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 253, t. 5, f. 12 u. 13.

Fundnotiz: Skagerrak, 58° 06′ N., 9° O., 660—420 m. 24. VI. 1911. „Thor“ Stat. 1571. Th. Mortensen. 3 Exemplare.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. 4 Exemplare.

Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 2 Exemplare.

Die Exemplare aus dem Trondhjemsfjord sind beerenförmig und auf *Pandocia pomaria* (Sav.) angewachsen. Das gleiche gilt von den Fär Öer Stücken, von denen das eine aber abgeflacht ist. Die Stücke aus dem Skagerrak, die zusammen mit *Tethyum mortenseni* erbeutet wurden, sind dagegen sämtlich mehr oder weniger abgeflacht und von grüner Farbe.

Verbreitung: Die Art wird zwar von der ganzen norwegischen Küste erwähnt, doch liegt eine specielle Angabe über ihr Vorkommen im Trondhjemsfjord nicht vor. Von den Fär Öer war die Art bereits bekannt. Der Fundort im Skagerrak ist neu.

Dendrodoa aggregata (Rathke).

1903 *Dendrodoa aggregata*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 235, t. 5, f. 8.

Fundnotiz: Får Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 5 Exemplare.

Unter dem Material befinden sich 5 typische, 25—30 mm lange Exemplare dieser Art. Von den Får Öer war die Art bisher nicht nachgewiesen.

Pandocia [Polycarpa] pomaria (Sav.).

1770 *Ascidia singularis*, Gunnerus in: Skr. Kjöbenh. Selsk., v. 10, p. 166, f. 1—6.

1893 *Polycarpa pomaria*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 444.

Fundnotiz: Skagerrak, 57° 24′ N., 7° 25′ O. 108 m. 20. VI. 1911. Th. Mortensen. 1 Exemplar.

Vor Tautra (Trondhjemsfjord), ca. 200 m. 31. VII. 1911. Th. Mortensen. Zahlreiche Exemplare.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. Zahlreiche Exemplare.

Får Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 10 Exemplare.

Aus dem Trondhjemsfjord liegt diese Art in grosser Menge vor und scheint daselbst nächst *Phallusia obliqua* (Ald.) die häufigste Ascidie zu sein. Herdman hat die Art bei Rödberg bereits nachgewiesen. Auch von den Får Öer ist die Art durch Traustedt schon bekannt geworden. Meine Exemplare von dort sind von verschiedener Grösse, teils mit sehr stark buckeliger Oberfläche, teils mit weniger ausgeprägten Buckeln.

Gunnerus hat aus dem Trondhjemsfjord, aus einer Tiefe von ca. 100 Fad., eine *Ascidia singularis* beschrieben. Zieht man den Fundort in Betracht und berücksichtigt gleichzeitig die von Gunnerus gegebenen Abbildungen, so kann meines Erachtens kein Zweifel darüber bestehen, dass beide Formen identisch sind. Es wäre dann der Artname *pomaria* durch *singularis* zu ersetzen. Doch mag das

einer späteren Gelegenheit vorbehalten bleiben, da diese Arbeit in der Hauptsache eine faunistische sein soll.

Pandocia [Polycarpa] pusilla (Herdm.).

1884 *Polycarpa pusilla*, Herdman in: Tr. R. Soc. Edinburgh, v. 32, p. 224, t. 35, f. 4—6.

Fundnotiz: vor Tautra (Trondhjemsfjord), ca. 200 m. 31.VII. 1911. Th. Mortensen. 1 Exemplar.

Das Exemplar, das ich dieser von Herdman bereits bei Rödberg nachgewiesenen Art zurechne, ist länglich elliptisch und hat einen grössten Durchmesser von 11 mm. Es ist völlig frei und dicht mit feinen Sandkörnchen bedeckt. Der Magen besitzt einen Blindsack. Der Afterrand ist gelappt. Das Flimmerorgan ist hufeisenförmig, die beiden Schenkel berühren einander, sind nicht spiralig aufgerollt, aber auch kaum einwärts gebogen. Die Öffnung ist nach links gewandt. Zwischen den Falten zählte ich, wo es sicher festzustellen war, 1—2 intermediäre innere Längsgefässe, manche Partien des Kiemensackes waren aber so stark geschrumpft, dass die Zahl der intermediären Gefässe sich nicht einwandfrei ermitteln liess. *Pandocia libera* (Kiær) ist zweifellos nahe verwandt mit dieser Art, doch ist die Zahl der intermediären inneren Längsgefässe (je 3—8, meist 4) grösser. Bei *Pandocia comata* (Ald.) dagegen verläuft in der Regel nur je 1 intermediäres inneres Längsgefäss zwischen zwei Falten, wie ich es constant bei Exemplaren von Roscoff und Plymouth gefunden habe. Exemplare von Ostende zeigten wieder 1—2 intermediäre Gefässe. Auch habe ich stets einen Magenblindsack gefunden. Im übrigen stimmen diese drei Formen in wichtigen Merkmalen (Geschlechtsorgane, Magenblindsack) überein, sodass es noch weiterer Untersuchungen bedarf, um über die Artberechtigung dieser Formen endgültig entscheiden zu können.

Fam. ***Botryllidae.***

Polycyclus lamarcki Herdm.

1886 *Polycyclus lamarcki*, Herdman in: Rep. Voy. Challenger, v. 14, p. 63, t. 4, f. 1—5.

Fundnotiz: Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 1 Kolonie.

Es liegt mir ein *Polycyclus* vor, den ich dieser Herdman'schen Art zurechnen möchte. Die Abgrenzung der nordwesteuropäischen und mediterranen *Polycyclus*-Arten bleibt darum nach wie vor eine offene Frage. Die Kolonie ist eine unregelmässig gelappte Masse, die eine grösste Breite von 35 mm und eine grösste Dicke von 17 mm besitzt. Die Art wurde in der Fär Öer—Shetland Rinne gesammelt und ist jetzt in unmittelbarer Nähe der Fär Öer wiedergefunden.

Ausserdem enthält die Collection noch einige Arten von *Botryllidae* aus dem Skagerrak (57° 24′ N., 7° 25′ O., 108 m. 20. VI. 1911. „Thor" Stat. 1566), deren Bestimung sich jedoch als untunlich erwies.

Fam. ***Rhodosomatidae [Corellidae].***

Corella parallelogramma (Müll.).

1893 *Corella parallelogramma*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 445.

Fundnotiz: Skarnsund (Trondhjemsfjord), ca. 200—150 m. 21. VII. 1911. Th. Mortensen. 1 Fxemplar.

Fam. ***Phallusiidae [Ascidiidae].***

Phallusia obliqua (Ald.).

1903 *Ascidia obliqua*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 280, t. 5, f. 18, t. 12, f. 7—12.

1893 *Ascidia compressa*, Herdman in: Ann. nat. hist., ser. 6. v. 12, p. 444.

Fuudnotiz: Skagerrak, 58° 06′ N., 9° O., 640 m. 24. VI. 1911. „Thor" Stat. 1571. Th. Mortensen. Viele Exemplare.

Skagerrak, 57° 24′ N., 7° 25′ O., 108 m. 20. VI. 1911. „Thor" Stat. 1566. Th. Mortensen. Viele Exemplare.

Vor Tautra (Trondhjemsfjord), ca. 200 m. 31. VII. 1911. Th. Mortensen. Viele Exemplare.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. Mehrere Exemplare.

Diese Art scheint sowohl im Trondhjemsfjord wie im Skagerrak ausserordentlich häufig zu sein. Die Stücke geben keinen Anlass zu weiteren Bemerkungen. Herdman führt die Art von Rödberg und Trondhjem unter dem Namen *Ascidia compressa* Müll. auf.

Phallusia conchilega (Müll.).

1893 *Ascidia plebeia*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 444.

Fundnotiz: Skagerrak, 57° 24′ N., 7° 25′ O., 108 m. 20. VI. 1911. „Thor" Stat. 1566. Th. Mortensen. 4 Exemplare.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. 2 Exemplare.

Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. Viele Exemplare.

Verbreitung: Von Trondhjem erwähnt Herdman diese Art bereits unter dem Namen *Ascidia plebeia* Ald. Von den Fär Öer war die Art noch nicht bekannt. Unter den zahlreichen Exemplaren von dort zeigen einige eine etwas mehr elliptische oder unregelmässige Gestalt, als es die Regel ist, und eine mächtig entwickelte Darmschlinge.

Phallusia virginea (Müll.); non Traust. et alii.

1893 *Ascidiella venosa*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 444.

1909 *Phallusia virginea*, Hartmeyer in: S. B. Ges. naturf. Fr. Berlin, ann. 1909, p. 225.

Fundnotiz: vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. 1 Exemplar.

Herdman hat diese Art bereits von Trondhjem nachgewiesen.

Ascidiella aspersa (Müll.).

Fundnotiz: Nordsee, 55° 16′ N., 7° 45′ O., 22 m. 17. VI. 1911. „Thor" Stat. 1535. Th. Mortensen. 2 Exemplare.

Fär Öer. Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI 1899. Th. Mortensen. Viele Exemplare.

Zwei Exemplare aus der Nordsee (6,4 und 5,3 cm lang) stimmen in ihrem Habitus durchaus mit Exemplaren von Helgoland überein, die bisher meist unter dem Namen *Ascidiella virginea* (Müll.) aufgeführt wurden. Ich werde aber demnächst zeigen, dass es sich nur um einen grossen Formenkreis handelt, der den Artnamen „*aspersa*“ führen muss. Die Oberfläche der beiden Nordseestücke ist im allgemeinen glatt — nur im Umkreis der Körperöffnungen finden sich einige Fortsätze — und mit Bryozoen und Balaniden bedeckt. Die Stücke von den Fär Öer, von wo die Art noch nicht bekannt war, sind meist klein mit ziemlich glatter Oberfläche.

Fam. ***Cionidae.***

Ciona intestinalis (L.).

Fundnotiz: Skagerrak, 57° 24′ N., 7° 25′ O., 108 m. 20. VI. 1911. „Thor“ Stat. 1566. Th. Mortensen. 5 Exemplare.

Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 4 Exemplare.

Fam. ***Didemnidae.***

Leptoclinides faeröensis Bjerk.

1905 *Leptoclinides faeröensis*, Bjerkan in: Bergens Mus. Aarbog. ann. 1905, nr. 5, p. 20, t. 3, f. 4—8.

Fundnotiz: vor Tautra (Trondhjemsfjord), ca. 200 m. 31.VII. 1911. Th. Mortensen.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen.

Verbreitung: Von beiden Fundorten liegen mir eine Anzahl typischer Kolonieen vor, die teilweise auf *Pandocia pomaria* (Sav.) und *Phallusia obliqua* (Ald.) angewachsen sind. Zu Bemerkungen geben sie keinen weiteren Anlass. Die Art ist bisher ausschliesslich in tieferem Wasser gefunden worden, und zwar nicht oberhalb 180 m. Nach unten bildet die bedeutende Tiefe von 2847 m die derzeitige Grenze. Die Art ist zur Zeit nachgewiesen n. w. Island (590 m), ö. Fär Öer (420 m), im Bereiche von Neu

Fundland und Neu Schottland (180—2847 m) und n. Helgeland (Norwegen) (260 m).

Didemnum albidum (Verr.).

1903 *Leptoclinum roseum*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 361, t. 6, f. 17 u. 18, t. 14, f. 17.
1910 *Tetradidemnum albidum*, Van Name in: P. Boston Soc., v. 13, p. 378, Textf. 13—15, t. 35, f. 2, t. 39, f. 13.

Fundnotiz: Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen.

Es liegt mir eine grössere Anzahl Kolonieen dieser Art vor, die teils ansehnliche Krusten, teils Polster bilden. Die Kalkkörper sind sehr zahlreich und zeigen die characteristische Gestalt, doch sind die Enden der Fortzätze vielleicht etwas weniger abgerundet, als Van Name sie abbildet.

Verbreitung: Diese auf die Arktis beschränkte, aber hier weit verbreitete Art war bei den Fär Öer bisher nicht nachgewiesen.

Didemnum tenue (Herdm.).

1893 *Leptoclinum tenue*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 445.

Fundnotiz: Skarnsund (Trondhjemsfjord), ca. 200—150 m. 21. VII. 1911. Th. Mortensen.
Vor Tautra (Trondhjemsfjord), ca. 200 m. 31. VII. 1911. Th. Mortensen.
Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen.

Von verschiedenen Stationen im Trondhjemsfjord liegen meist auf *Pandocia pomaria* (Sav.) oder *Phallusia obliqua* (Ald.) angesiedelte und hier dünne Ueberzüge oder winzige Polsterchen bildende Kolonieen einer *Didemnum*-Art vor, die wohl zu *D. tenue* (Herdm.) gehört, das durch Herdman ebenfalls von Rödberg erwähnt wird. Die Kalkkörper entsprechen durchaus der Abbilduug Herdman's und sind ausgezeichnet durch zahlreiche, spitzzulaufende Fortsätze.

Verbreitung: Ob die von den verschiedensten Punkten als *D. tenue* aufgeführten Kolonieen thatsächlich alle zu einer Art gehören, ist bei dem gegenwärtigen Stande der Didemniden-Systematik kaum sicher zu entscheiden. Sicher gehört wohl die Form, die Herdman aus der warmen Zone des Wyville Thomson Rückens unter diesem Namen aufführt, zu derselben Art, wie die norwegischen Stücke. Die Art scheint, die artliche Zusammengehörigkeit der unter diesem Namen beschriebenen Formen immer vorausgesetzt, das tiefe Wasser zu bevorzugen. Allerdings wird sie auch aus dem oberen Litoral erwähnt, und zwar von Michaelsen (Magalh. Bezirk) wie von Sluiter (West-Indien). Daneben liegen aber die Angaben Herdman's über ihr Vorkommen in recht beträchtlichen Tiefen vor (bis 1080 m an der patagonischen Küste und 960 m am Wyville Thomson Rücken).

Fam. ***Synoicidae.***

Macroclinum pomum (Sars).

1893 *Amaroucium pomum*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 445.

1903 *Macroclinum pomum & crater*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 319, t. 6, f. 5, t. 13, f. 6 u. 7, Textf. 37—39.

Fundnotiz: Skarnsund (Trondhjemsfjord), ca. 200—150 m. 21. VII. 1911. Th. Mortensen. 1 Kolonie.

Vor Tautra (Trondhjemsfjord), ca. 200 m. 31. VII. 1911. Th. Mortensen. Einige Kolonieen.

Vor Rödberg (Trondhjemsfjord), ca. 300 m. 27.VII. 1911. Th. Mortensen. 2 Kolonieen.

Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 2 Kolonieen.

Die vorliegenden Kolonieen sind durchweg von geringer Grösse, im Vergleich mit den riesigen Kolonieen aus der Nordsee oder von Neu Fundland geradezu winzig. Die grösste Kolonie aus dem Trondhjemsfjord ist kuppelförmig bei einem Durchmesser von 22 mm und einer Höhe von 20 mm. Unter den kleineren Kolonieen befinden

sich zwei mit einem relativ langen und schlanken Stiel. Eine Kolonie von den Fär Öer zeigt am Vorderende eine eigentümliche Einsenkung, wie ich sie früher bei einer Neu Fundland-Kolonie beschrieben habe.

Verbreitung: Die Art, die sich durch den ganzen subarktischen Atlantic verbreitet und teilweise auch noch bis in arktisches Gebiet vordringt, war bereits von den Fär Öer (Bjerkan) wie auch von Rödberg (Herdman) bekannt.

Aplidium pallidum (Verr.).

1910 *Aplidium pallidum*, Van Name in: P. Boston Soc., v. 34, p. 400, Textf. 22.
1886 *Aplidium despectum*, Herdman in: Rep. Voy. Challenger, v. 14, p. 270, t. 28, f. 11—13.
1903 *Aplidium lacteum*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 338, t. 6, f. 13, t. 13, f. 16.
?? 1893 *Aplidium spec.*, Herdman in: Ann. nat. hist., ser. 6, v. 12, p. 446.

Fundnotiz: vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. 5 Kolonieen.
Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. 10 Kolonieen.

Es liegen mir zunächst 5 Kolonieen aus dem Trondhjemsfjord vor, von denen 4 auf *Phallusia obliqua* (Ald.) befestigt und hier kleine, unregelmässig gelappte Polster bilden, während eine an einer Wurmröhre angewachsen ist. Eine der grösseren dieser Kolonieen ist 18 mm lang, 13 mm breit und 7 mm dick. An der Anheftungsstelle findet sich etwas reichlicher Sand, sonst ist der Cellulosemantel nur spärlich mit Sandkörnchen durchsetzt. Die Farbe der Kolonieen ist glasig durchscheinend, mit graulichem oder bläulichem Schein, während die Einzeltiere sehr deutlich als dunklere, gelbbräunliche Körperchen sichtbar sind. Systeme sind nicht zu erkennen. In ihrem allgemeinen Habitus, speciell in der Farbe, gleichen die Kolonieen sehr denjenigen, die ich früher als *Aplidium lacteum* Huitf.-Kaas von Ost-Spitzbergen beschrieben habe, nur dass letztere

keine Polster bildeten, sondern von aufrecht keulenförmiger Gestalt waren, während die von Huitfeldt-Kaas beschriebenen norwegischen Kolonieen ebenfalls polsterförmige bzw. unregelmässig gelappte Massen darstellten.

Die Anatomie der Einzeltiere lässt einen Zweifel an der Zugehörigkeit dieser Koloniee zu *A. pallidum,* das ich für synonym mit *A. lacteum* halte, kaum zu. Die Lage und der Bau der Egestionsöffnung ist typisch. Ich bemerke, dass die Entfernung von der Ingestionsöffnung verschieden gross sein kann, und dass ihr Rand in der Regel schwach gelappt ist, unter Umständen sogar einzelne Lobi zu unterscheiden sind. Eine Analzunge fehlt dagegen. Der Magen besitzt etwa 10 tiefe Längsfalten. Im übrigen sind die Einzeltiere sehr stark geschrumpft und zusammengekrümmt. Ihre Länge beträgt nur wenig mehr als 1 mm. Infolgedessen habe ich auch die Zahl der Kiemenspaltenreihen nicht sicher feststellen können. In einem Falle glaube ich 6 gezählt zu haben.

Weiter enthält das Material eine Anzahl Kolonieen von den Fär Öer, die ebenfalls zu obiger Art gehören dürften. Die Art war von dort noch nicht bekannt. Von den norwegischen und auch von den Spitzbergen-Kolonieen unterscheiden sich diese Kolonieen rein äusserlich durch die mehr blass gelbliche bis bräunliche Farbe. Aber Van Name macht bereits darauf aufmerksam, dass die Farbentöne in Alcohol conservierter Kolonieen sehr verschieden sind und alle Nuancen von milchig gelbweiss bis ziemlich dunkelgraubraun aufweisen können. Auch sind die Kolonieen nicht unerheblich grösser. Sie erreichen einen grössten Durchmesser von 38 mm, überschreiten also in allen Fällen die bisher bekannten Masse. Die Mehrzahl der Kolonieen bildet mehr oder weniger gelappte, oder auch mehr rundliche und polsterförmige, bis 15 mm dicke und 38 mm lange, ungestielte Massen. Daneben enthält das Material aber auch Kolonieen von aufrecht feigen oder breit keulenförmiger Gestalt mit verschmälertem Hinterende, bei einer Länge von 30 und einer Breite von 25 mm.

Zur Anatomie der Einzeltiere habe ich keine besonderen Be-

merkungen zu machen. Die Tiere sind sehr stark contrahiert, sodass auch hier die Zahl der Kiemenspaltenreihen nicht sicher festgestellt werden könnte. Magen und Egestionsöffnung zeigen die Artmerkmale in typischer Weise.

Van Name, der neuerdings die von Verrill als *Amarou-cium pallidum* nur ungenügend characterisierte Art nachuntersuchte, hat bereits auf die äusserst nahe Verwandtschaft von *pallidum* und *lacteum* hingewiesen, die seiner Ansicht nach sehr wahrscheinlich identisch sind. Ich kann Van Name darin nur beistimmen und glaube, nachdem ich amerikanische Kolonieen ebenfalls untersucht habe, dass einer Vereinigung beider Formen unter dem älteren Artnamen *pallidum* thatsächlich nichts im Wege steht. Durch den Nachweis von *A. pallidum* bei den Fär Öer wird die östlich- und westlich-atlantische Formengruppe dieser Art auch geographisch näher verbunden.

Ob das *Aplidium spec.*, welches Herdman aus dem Trondhjemsfjord aufführt, zu dieser Art gehört, ist ohne Nachuntersuchung nicht zu entscheiden, da ja auch noch andere *Aplidium*-Arten in diesem Gebiete vorkommen. Dagegen dürfte das *A. despectum* desselben Autors, worauf Van Name mit Recht hinweist, wohl identisch mit *A. pallidum* sein.

Die Art geht in ziemlich bedeutende Tiefen herab und scheint überhaupt das tiefere Wasser zu bevorzugen. Die grösste Tiefe, in welcher die Art gesammelt wurde (bei Neu Fundland), beträgt 847 m. In der oberen Litoralzone ist die Art bisher überhaupt nicht gefunden worden.

Aplidium spec. aff. spitzbergense Hartmr.

1903 *Aplidium spitzbergense*, Hartmeyer in: Römer u. Schaudinn, Fanua arctica, v. 3, p. 341, t. 6, f. 14, t. 13, f. 17.

Fundnotiz: vor Rödberg (Trondhjemsfjord), ca. 300 m. 27. VII. 1911. Th. Mortensen. Mehrere Kolenieen.

Mehrere kleine Kolonieen einer *Aplidium*-Art glaube ich dem Formenkreis des *Aplidium spitzbergense* Hartmr. zuordnen zu sollen.

Diese Art ist früher von mir von Spitzbergen beschrieben worden, seither aber nicht wieder gesammelt worden.

Die Kolonieen bilden kleine, länglich polsterförmige oder mehr halbkugelige Massen von recht unregelmässiger Gestalt, nicht mehr als 10 mm lang. Systeme sind nicht zu erkennen. Die Einzeltiere sind vielmehr ganz unregelmässig angeordnet. Die Oberfläche ist mit kleinen Steinchen und Sandkörnchen bedeckt, besonders an der Anheftungsfläche der Kolonie.

Der Cellulosemantel ist dünn, glasig durchscheinend, mit bläulichem Schimmer, dicht mit Sandkörnchen durchsetzt. Die Einzeltiere schimmern als blassgelbe Flecken deutlich durch.

Die Einzeltiere sind sehr klein, kaum 2 mm lang. Der Thorax ist etwas länger, als das Abdomen. Bisweilen sind diese beiden Körperabschnitte zusammen so lang wie das Postabdomen, manchmal ist letzteres dagegen erheblich kürzer.

Die Egestions-Öffnung liegt dicht bei der Ingestions-Öffnung, nur wenig auf die Dorsalseite verlagert und trägt eine kurze, bisweilen hakenförmig gebogene, einfache Analzunge.

Der Kiemensack besitzt nur vier Reihen von Kiemenspalten, die aber ziemlich lang sind. Die Zungen der Dorsalfalte sind nur kurz.

Der Magen besitzt nur wenige, kaum ausgebildete Längsfalten. In einem Falle glaube ich 4 mit Sicherheit festgestellt zu haben. Im übrigen war der Darmtractus sehr stark contrahiert und infolge reichlicher Kotmassen nur schwer zu untersuchen.

Das Postabdomen wird zum grössten Teil von grossen Hodenfollikeln ausgefüllt, die teils in einfacher, teils in doppelter Reihe angeordnet sind. Die meisten Einzeltiere enthielten in einer Aussackung des Kloakalraumes zwei bis drei geschwänzte Embryonen.

Wie sich aus obiger Diagnose ergiebt, stimmt unsere Form sowohl in den äusseren Characteren der Kolonie, wie auch im anatomischen Bau der Einzeltiere in allen wesentlichen Merkmalen mit *Aplidium spitzbergense* überein. Wie bei jener Art besitzen die Einzeltiere eine Analzunge, nur wenige (in beiden Fällen 4) Kiemen-

spaltenreihen und ebenfalls nur wenige und schwach ausgeprägte Magenfalten, sodass an der nahen Verwandtschaft beider Formen wohl kaum zu zweifeln ist. Von einer Vereinigung beider Formen möchte ich aber bis auf weiteres noch absehen, da sich auch einige kleine Unterschiede, wenn auch nur untergeordneter Art, finden. Zunächst werden die Einzeltiere von *A. spitzbergense* wesentlich grösser (bis 5 mm) und sind auch regelmässiger angeordnet. Vor allem aber liegt die Egestions-Öffnung bei *A. spitzbergense* nicht unbeträchtlich tiefer und trägt eine viel längere, schlankere Analzunge.

Sidnyum turbinatum (Sav.).

1872 *Circinalium concrescens*, Giard in: Arch. Zool. expér., v. 1. p. 639, t. 25, f. 1—8.

Fundnotiz: Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1899. Th. Mortensen. Viele Kolonieen.

Das Material enthält zahlreiche, deutlich gestielte Kolonieen, die wohl sicher dieser Art zugerechnet werden müssen. Sie sind teils an *Pandocia pomaria* (Sav.) und *Ascidiella aspersa* (Müll.), teils an Hydroiden, Bryozoen oder Schalentrümmern befestigt. Der Magen zeigt blindsackartige Verdickungen (pseudo-aréolé). Die Zahl der Kiemenspaltenreihen beträgt allerdings 8—10, während sie nach Lahille zwischen 7 und 8 schwankt. Vielleicht ist diese etwas höhere Zahl ein localer Character der Fär Öer-Form, da ich bei den subarktischen Stüchen (z. B. von Helgoland) sonst auch nur 7—8 Reihen von Kiemenspalten beobachtet habe. Die Exemplare gehören in der Hauptsache der *var. democraticum* an.

Verbreitung: Diese ausgesprochen subarktische und auch mediterrane Art ist neu für die Fär Öer und auch sonst noch nirgends in der Arktis oder doch im Bereiche des arktisch-subarktischen Grenzgebietes gefunden worden.

Synoicum incrustatum (Sars).

1903 *Synoicum incrustatum*, Hartmeyer in: Römer u. Schaudinn, Fauna arctica, v. 3, p. 352, t. 6, f. 11, t. 14, f. 5.

Fundnotiz: Fär Öer, Tief am Nordende von Nolsö, ca. 100 Fad. 14. VI. 1911. Th. Mortensen. Einige Kolonieen.

Verbreitung: Das Material enthält mehrere kleine, keulenförmige Kolonieen dieser für die Fär Öer neuen Art. *Synoicum incrustatum* war, wie alle nordischen *Synoicum*-Arten, in seiner Verbreitung bisher auf die Arktis beschränkt und zwar auf das Gebiet von Spitzbergen, dem weissen Meer, der Murmanküste und dem arktischen Norwegen (südl. bis zu den Lofoten). Um so interessanter ist der Nachweis ihres Vorkommens bei den Fär Öer.

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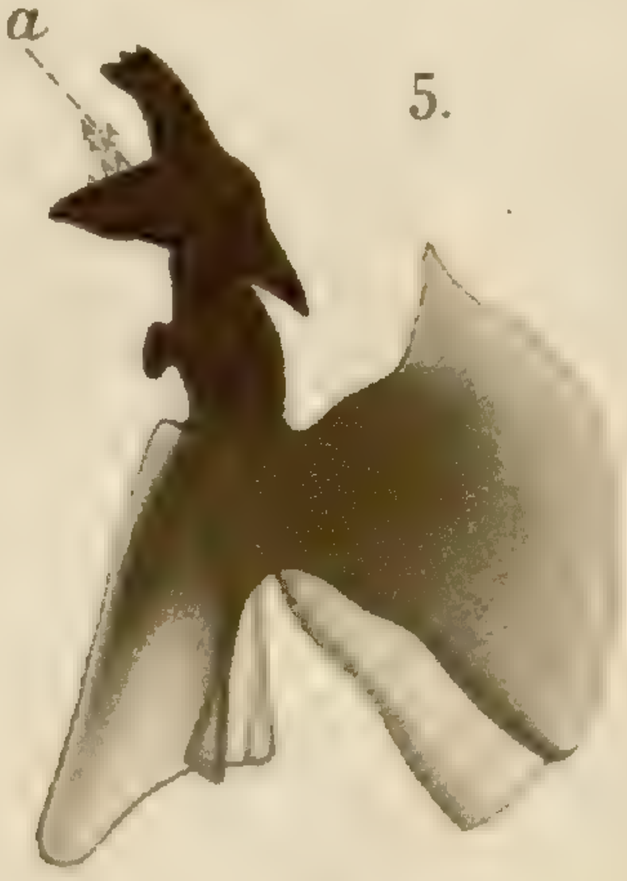

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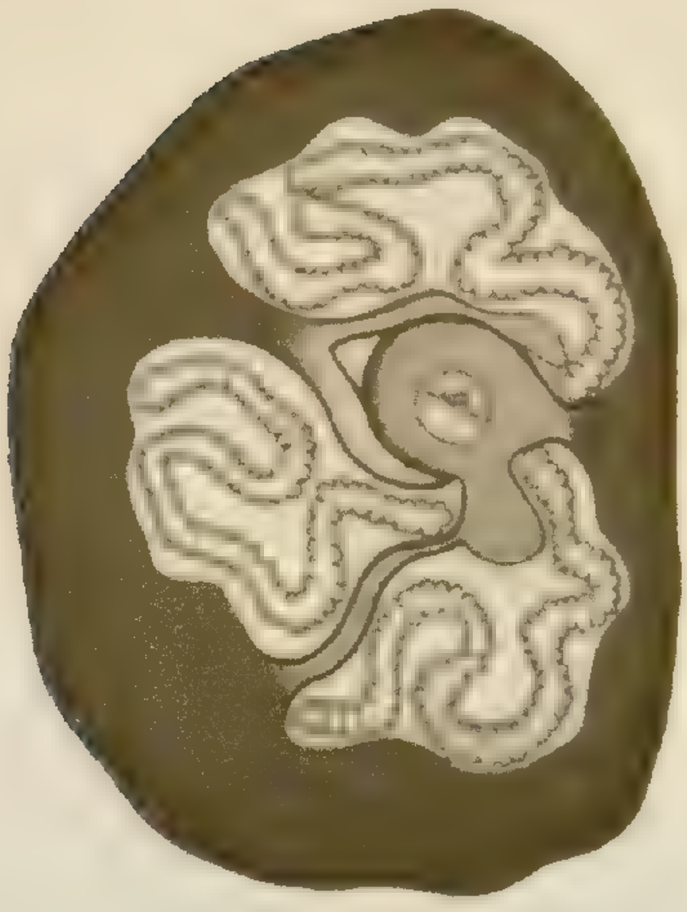

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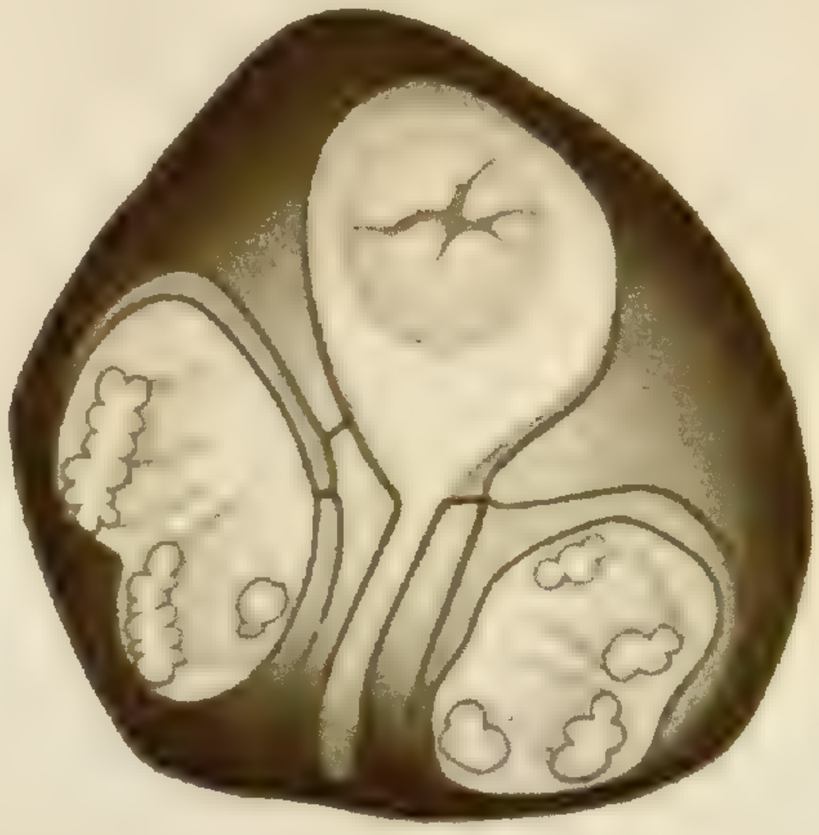

J.C. Nielsen del

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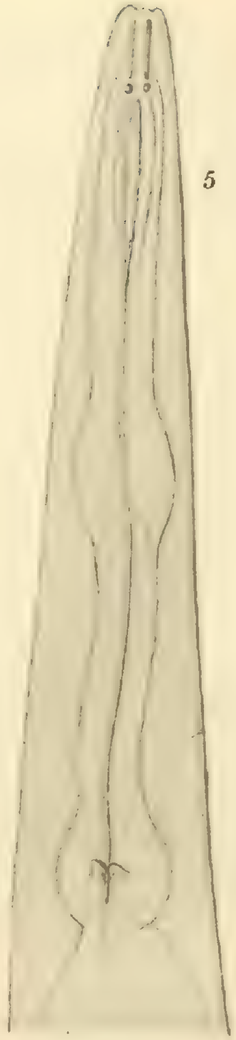

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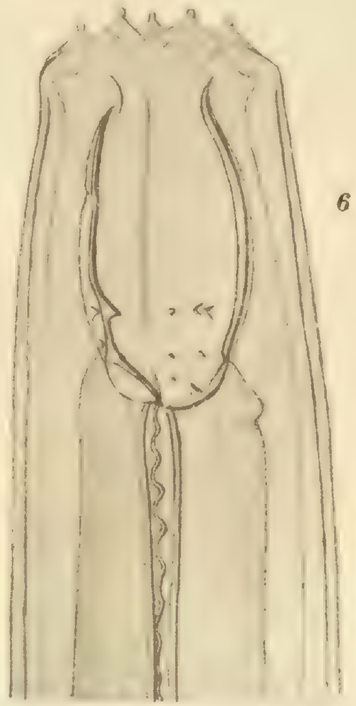

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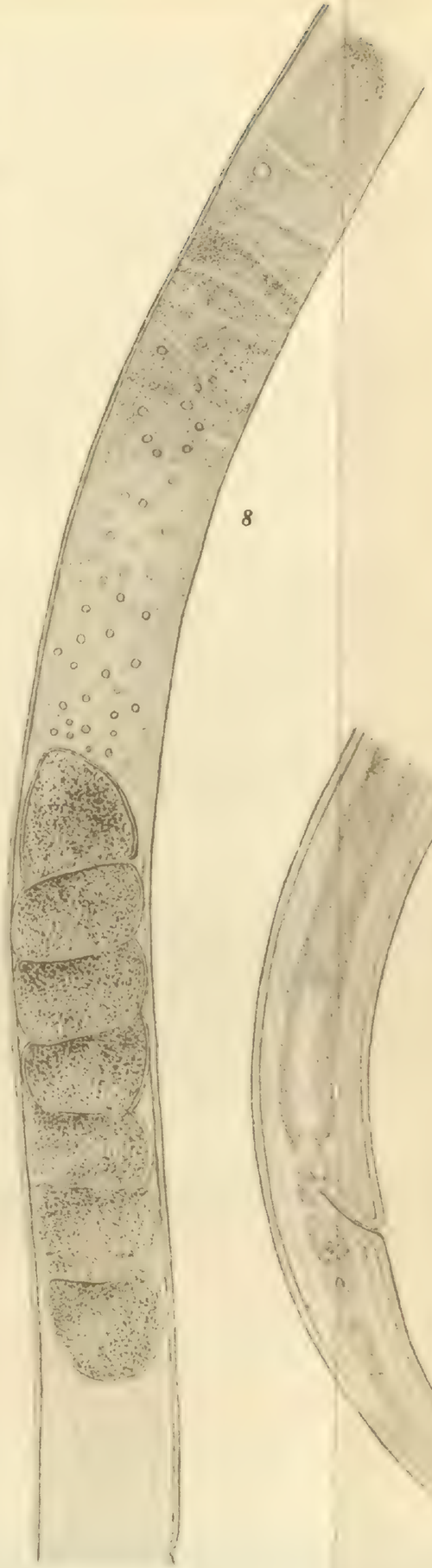

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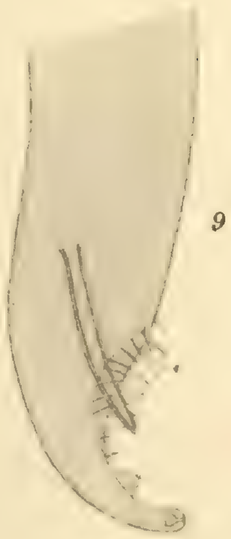

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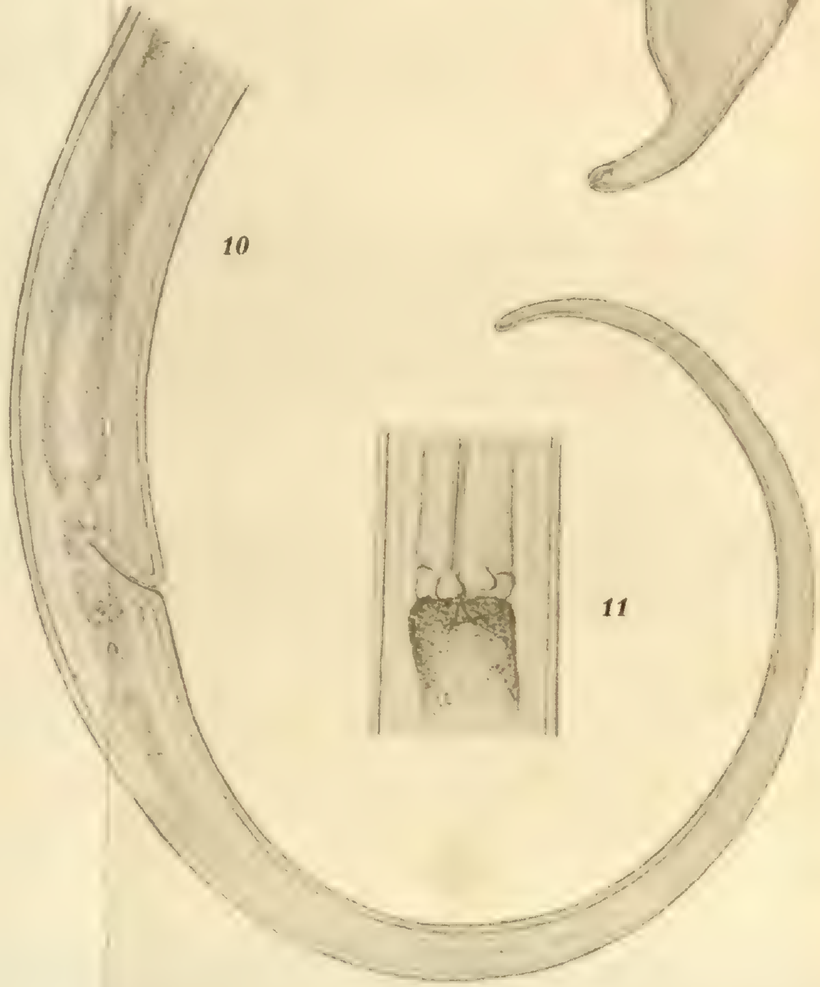

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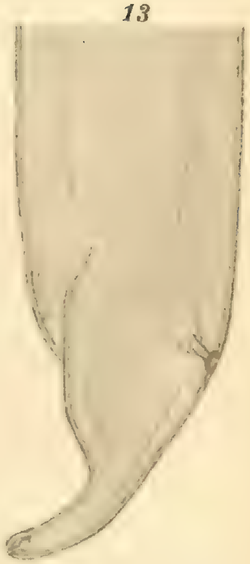

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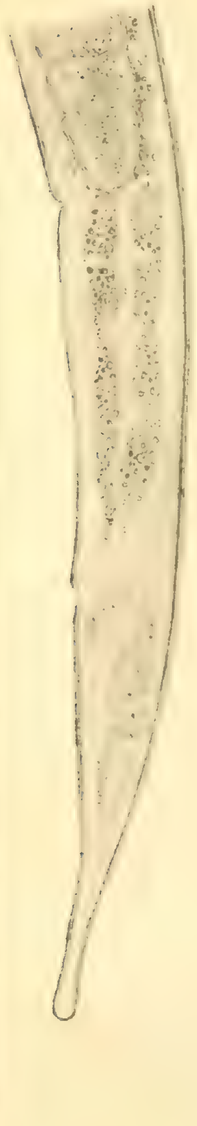
Hj. Dittevsen del.

Pacht & Crone phototyp.



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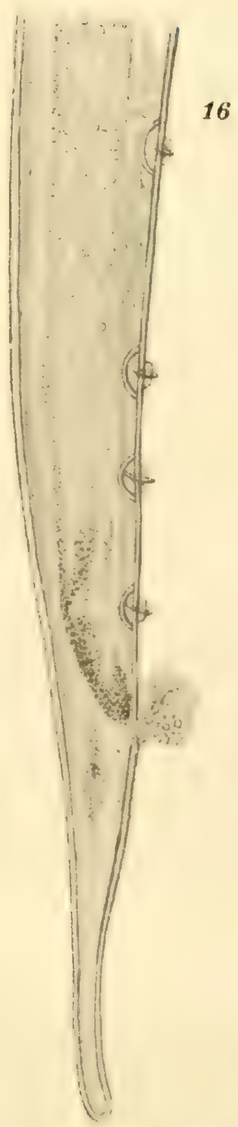

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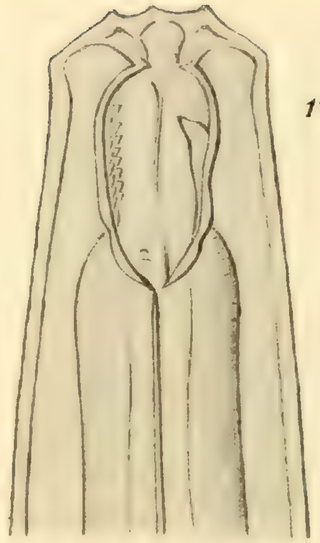

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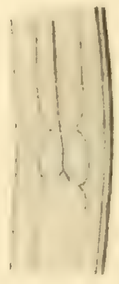

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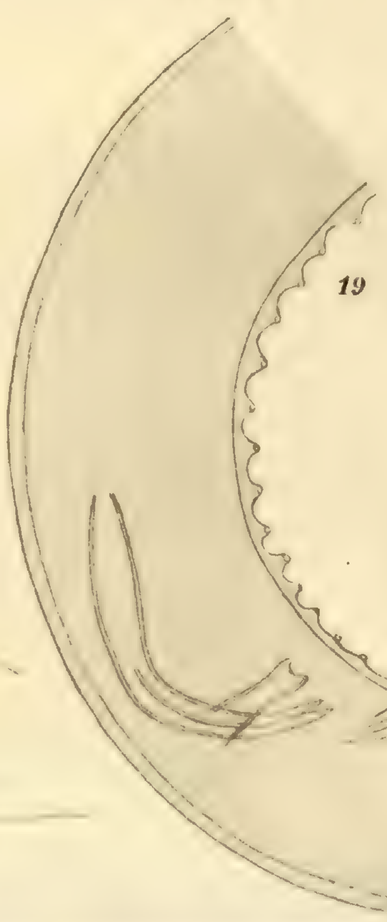

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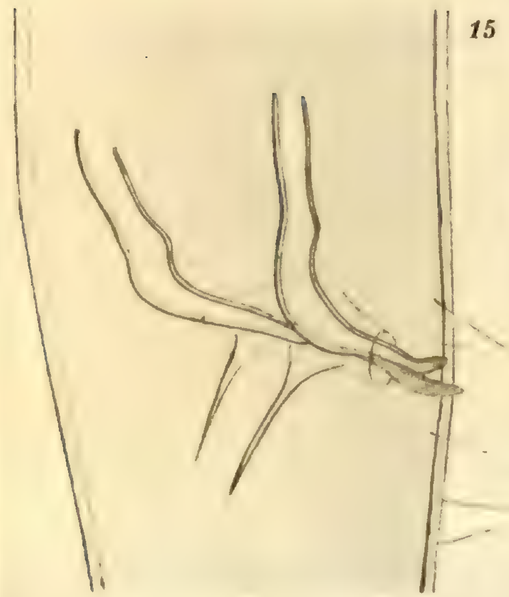

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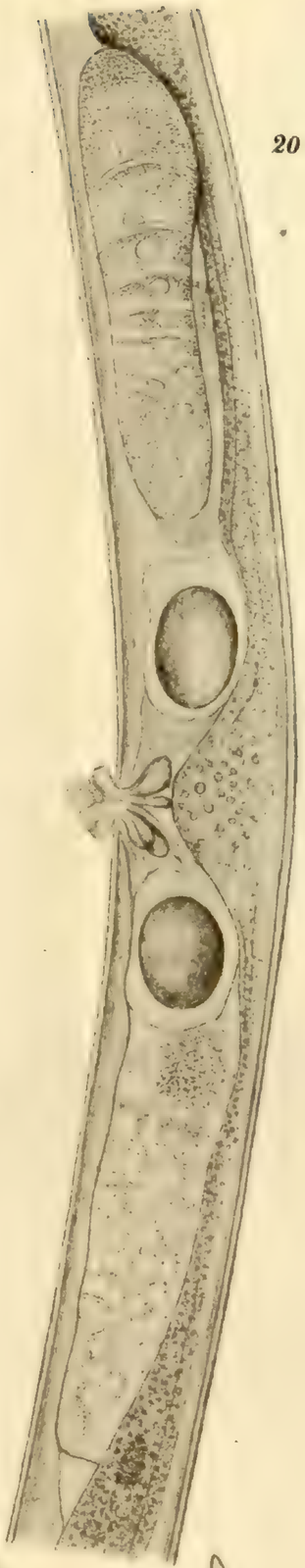

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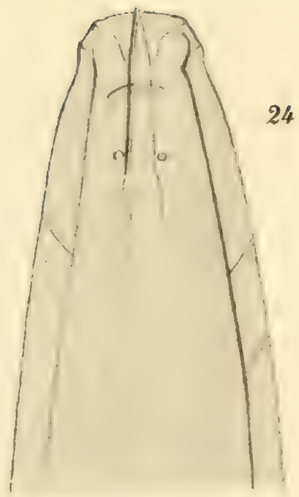

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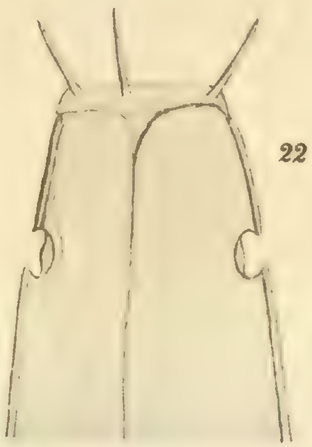

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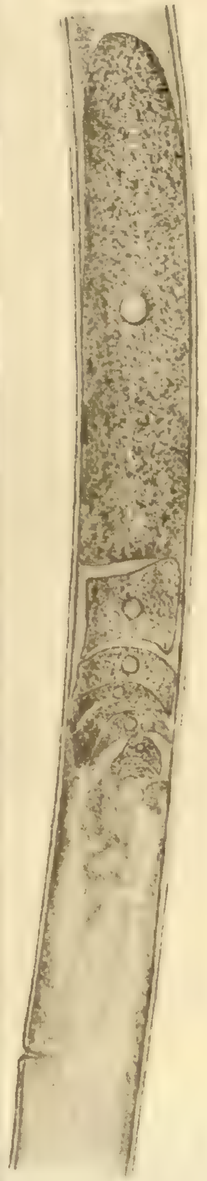

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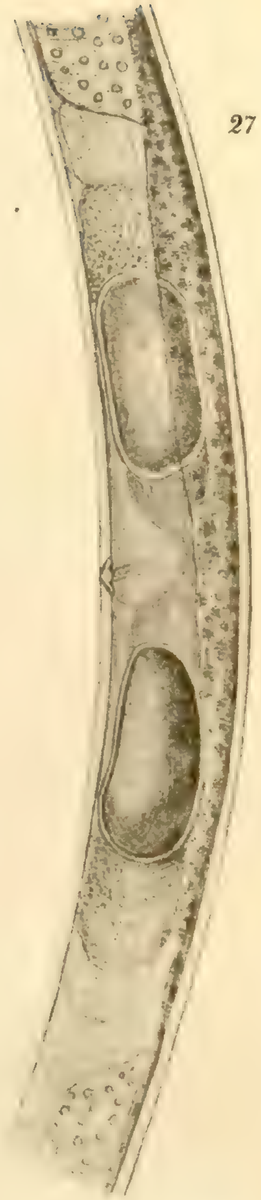

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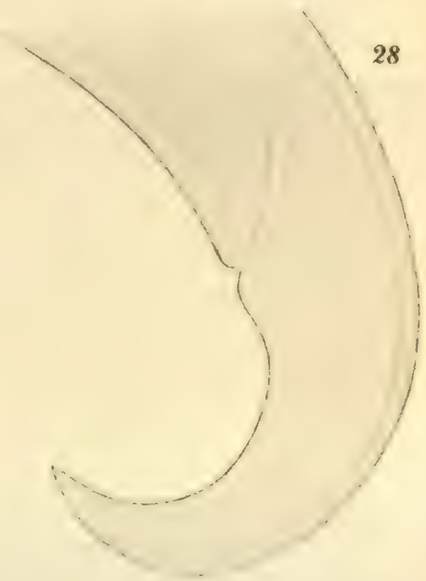

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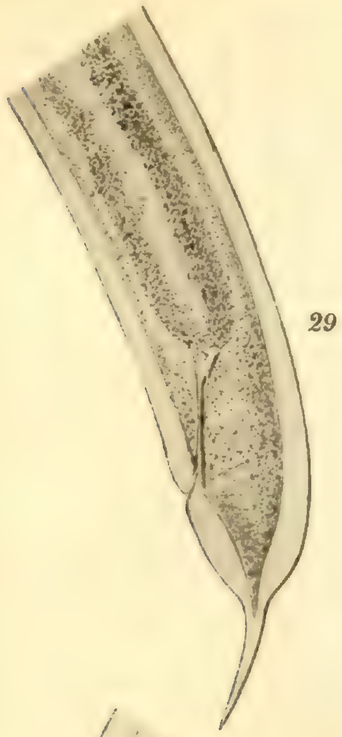

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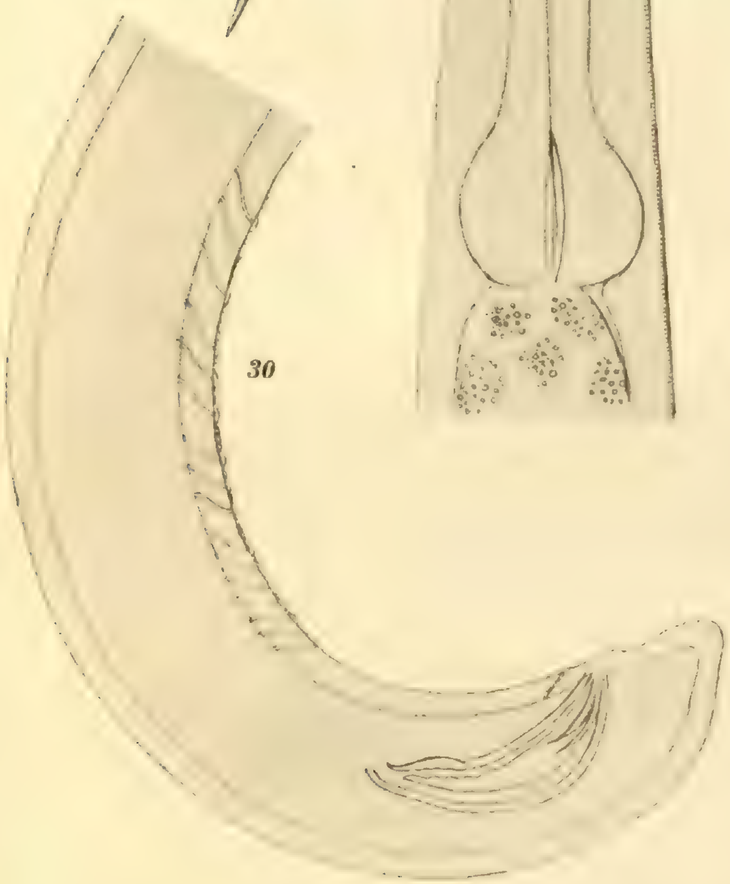

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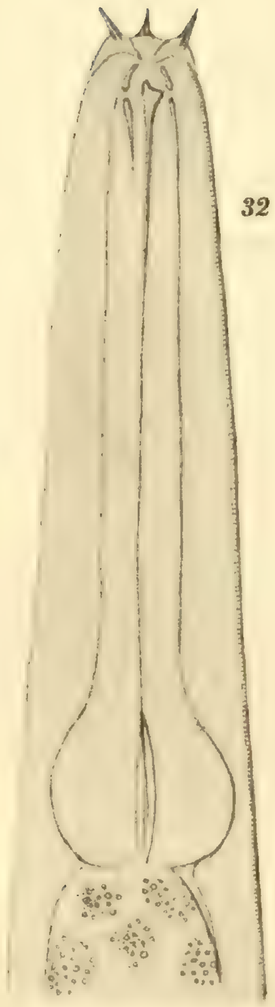

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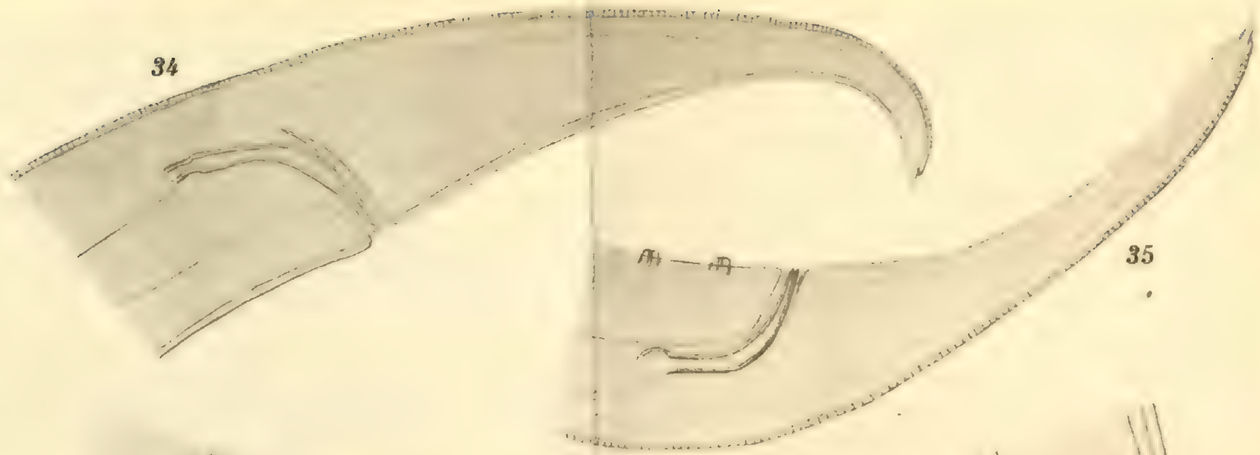

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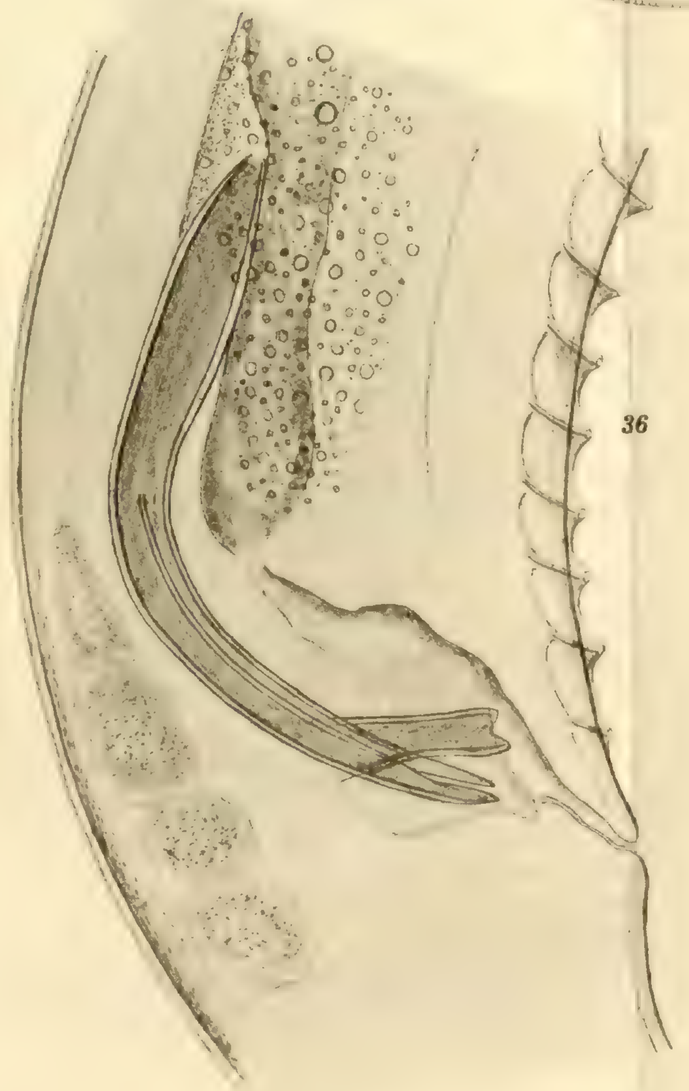

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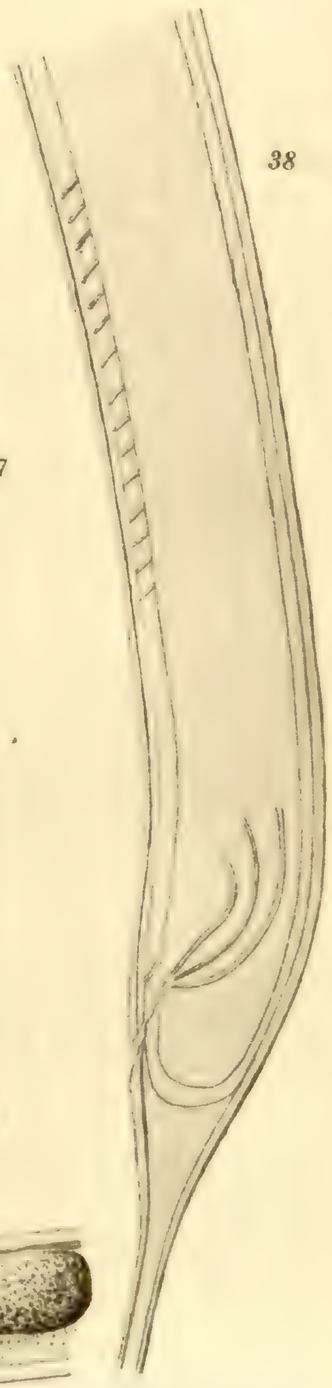

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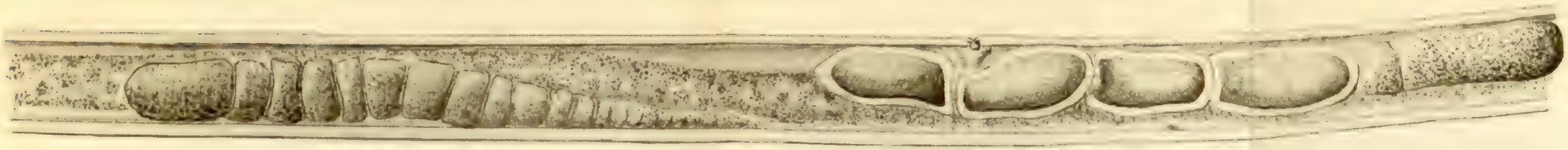

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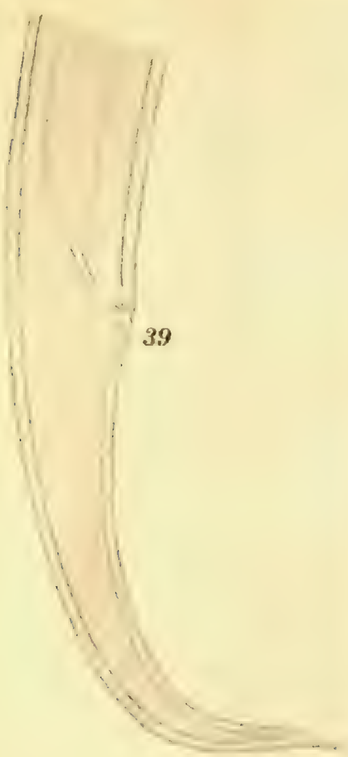
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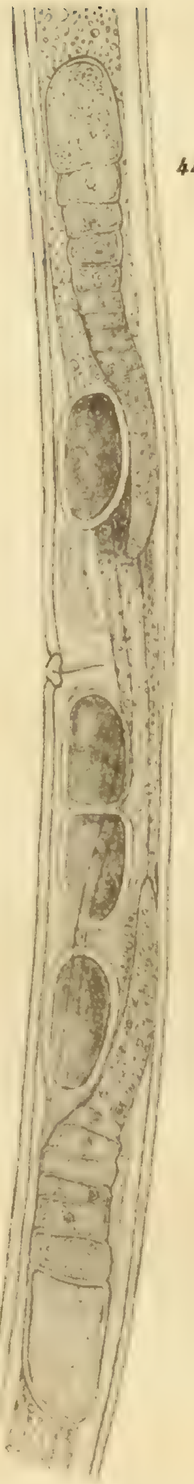
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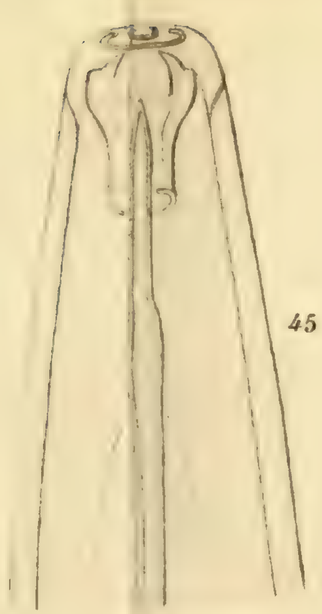
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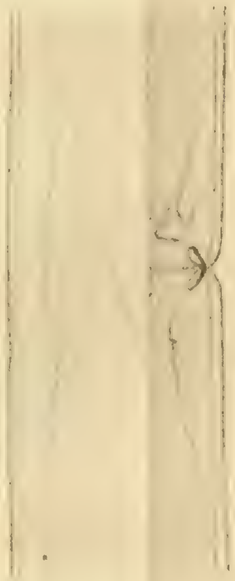
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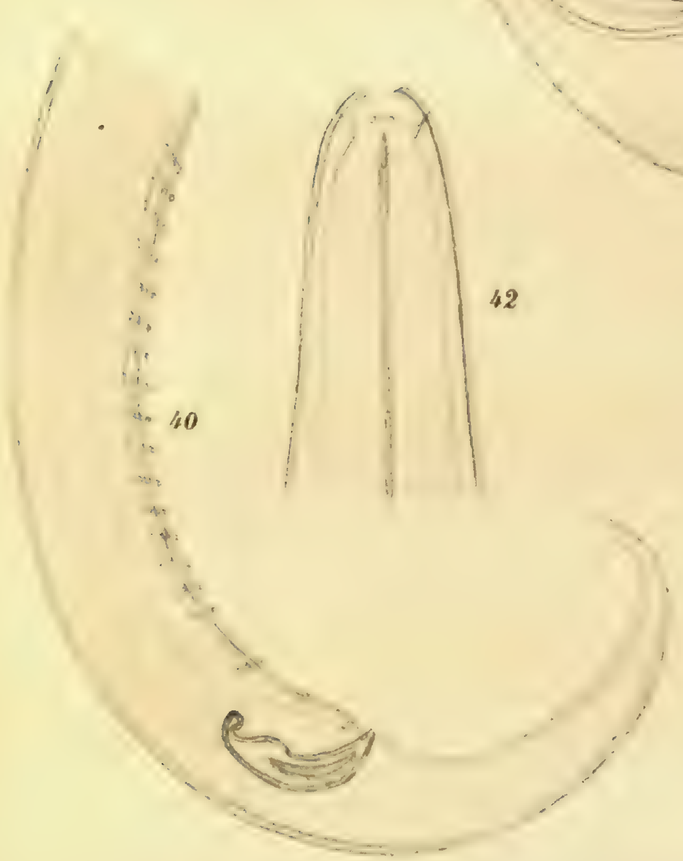
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DANMARK

Fyr, Fyrskib.

Skagens Rev
Skagen
Højer
Hirtshals
Rubjerg Knude
Hjörring
Hirtsholm
Frederikshavn
Laso Trindel
Vendsyssel
Sæby
Nordre Rön
Læsö
Læsø Rende
Kobbergrunden
Hanstholm
Östre Flak
Aalborg
Thisted
Lögstör
Nibe
Egense
Thy
Lodbjerg
Nykjöbing
Mors
Thyborön Kanal
KATTEGAT
Anholt
Anholt Knob
Ostenbakke
Salling
Skive
Hobro
Mariager
Udbyhöj
Bovbjerg
Lemvig
Struer
Viborg
Randers
Fornæs
Grenaa
Holstebro
JYLLAND
Æbeltoft Vig
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Hjelm
Schultz Grund
Silkeborg
Aarhus
Ringkjöbing
Herning
Lyngvig
Skanderborg
Thurö
Sejrö
Nykjöbing
Horsens
Samsö
Vestborg
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Regnæs
Kalundborg
Varde
Horns Rev
Ebelö
Fredericia
Kolding
Skib
Middelfart
Bogense
Store
Romsö
SJÆLLAND
Roskilde
KJØBENHAVN
Ringsted
Sorö
Kjöge
Ribe
Odense
Tarteminde
Belt
Slagelse
Halskov
Lille
FYEN
Nyborg
Korsör
Assens
Skjelskör
Nastved
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Helnæs
Omö
Halholm
Præsto
Faaborg
Svendborg
Nekö
Möen
Sigöltofte
Rudkjöbing
LANGE
LAND
Tears
Nakskov
FALSTER
Gjedser
Gjedser Rev
Bornholm
Hammeren (Hammershus)
Christiansö
Hasle
Rönne
Svaneke
Aakirkeby
Nexö
Dueodde
Sund
Helsingör
Öre
Frederiksværk
Hillerød
Frederikssund
Nakkehoved
Kronborg
Skelskjör
Ystad
Simrishamn
Trelleborg
Malmö
Landskrona
Helsingborg
Ängelholm
Halmstad
Varberg
Falkenberg
Kullen
Hven
Ven
Lysekil
Marstrand
Kungälf
Skallingen
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Esbjerg
Vyl
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LAND
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Nakskov
FALSTER
Gjedser
Gjedser Rev
Bornholm
Hammeren (Hammershus)
Christiansö
Hasle
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Sund
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Hillerød
Frederikssund
Nakkehoved
Kronborg
Skelskjör
Ystad
Simrishamn
Trelleborg
Malmö
Landskrona
Helsingborg
Ängelholm
Halmstad
Varberg
Falkenberg
Kullen
Hven
Ven
Lysekil
Marstrand
Kungälf
Skallingen
Fanö
Esbjerg
Vyl
Sanden
Hvide Sande
Ströby Egede
Skjoldnæs

FÆR-ÖERNE

Strömö
Österö
Myggenæs
Vaagö
Tofte
Waalsö
Sandö
Sudero
Sviney
Valgatange

4° 3° 2° 1° 0° 1° 2° 3°
7°
57°
56°
55°
51°

Videnskabelige Meddelelser

fra

Dansk naturhistorisk Forening i Kjøbenhavn

Bind 64.

Udgivne af Selskabets Bestyrelse.

Med 5 Tavler, 1 Kort og 103 Figurer i Texten.

Syvende Aartis fjerde Aargang.

vol 74

No. Bot. Garden
1913

Kjøbenhavn.

Bianco Lunos Bogtrykkeri.

1913.

Redaktionen af dette Bind er besørget af Dr. *Th. Mortensen*.

Indhold.

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Oversigt over de videnskabelige Møder i Dansk naturhistorisk Forening i Vinterhalvaaret 1911—12 V

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Johs. Schmidt: Contributions to the biology of some North Atlantic species of Eels. (Med 4 Figurer, Kort, i Texten). (Hertil Tavle III) 39

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Forklaring af Tavlerne.

Tavle I. Fig. 1. *Scopelus glacialis* med snyltende Copepod (*Sarcotretes scopeli*) bærende den epizoiske Hydroid, *Ichthyocodium sarcotretis*. Fig. 2—6. *Ichthyocodium sarcotretis*. Fig. 7—10. *Sarcotretes scopeli*.

Tavle II. Fig. 1—26. *Sarcotretis scopeli*. Fig. 27. *Peroderma bellottii*. (Se Tavleforklaringen S. 30—32).

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Tavle IV—V. Hydroider (Sertularider); se Tavleforklaringen S. 316—318.

Oversigt

over

de videnskabelige Møder

i

Dansk naturhistorisk Forening

i Vinterhalvaaret 1911—12.

Den 27. Oktober 1911. Dr. *Th. Mortensen* holdt Foredrag om *Asteronyx Loveni.* (Se Afhandlingen „Über Asteronyx Loveni. M. Tr." i Zeitschr. f. wiss. Zoologie. Bd. CI. 1912. Festschrift für Ludwig).

Mag. sc. *Hj. Ditlevsen* gav Meddelelse om nordiske Annelider (se Afhandlingen „Annelids from the Danmark Expedition". Medd. om Grønland. Bd. XLV. 1912). Prof. *Jungersen* bemærkede, at det mulig kunde vise sig, at den massevise Optræden af den epitoke Form af Scalibregma inflatum var afhængig af Maanefaserne, ligesom ved „Palolo"s og beslægtede Formers Optræden.

Den 10. November. Dr. *C. Wesenberg-Lund* og Dr. *A. Bøving* holdt Foredrag om Dytiscernes Biologi og Morphologi. (Se Afhandlingerne af *C. Wesenberg-Lund* „Biologische Studien über Dytisciden" og *A. Bøving* „Studies relating to the anatomy, the biological adaptations and the mechanism of ovipositor in the various genera of Dytiscidae". Intern. Revue der gesamt. Hydrobiol. u. Hydrogr., Biolog. Suppl., V. Serie 1912).

Den 24. November. Referatmøde. Dr. *J. C. Nielsen* gav Meddelelse om Dermatobia-Larven hos Mennesket (Ref. af *Aug. Busk's* Afhandling: On the rearing of a Dermatobia hominis Linnæus. Proc. Entomol. Soc. Washington XIV. 1912) samt foreviste fritbyggede Kager af Honningbien (se Afhandlingen i dette Bind). Cand. mag. *P. Krarup* gav Meddelelse om nyere Fund af Skeletdele af primitive Mennesker; hertil gjorde Docent *Stamm* og Pastor *Breitung* nogle Bemærkninger. Dr. *Th. Mortensen* foreviste en Del Dyreformer fra Skagerak og Trondhjemsfjorden, indsamlede af ham i Sommeren 1911.

Den 8. December. Dr. *C. G. Joh. Petersen* holdt Foredrag om Tangplanternes Mængde og Aarsproduktion ved de nordeuropæiske Kyster. Foredragsholderen viste ved Hjælp af den franske officielle Statistik, at det maa antages, at ved de franske og engelske Kyster kan der aarlig høstes op mod 12,000 Millioner kg. Alger, naar Frankrigs Kyster i Bretagne tages som Maalestok. Dette Tal er langt større end det Antal kg. Fisk, der aarlig fanges i disse Have, nemlig c. 1,300 Millioner kg. Af disse Fisk er over Halvdelen pelagiske Fisk, som Sild og Makrel, der maa antages at leve af Plankton. Han udtalte, at der snarere fiskes mere af den „demersale" Fiskebestand end af Algebestanden, og at man fremtidig ikke kan lade denne ude af Betragtning, naar Talen er om at gøre Rede for Stofskiftet i Nordsøen, selv om der mellem Algerne og Fiskene maa indskydes et Gennemgangsled, Havbundens Invertebrater, der antages at leve af organisk Detritus, stammende fra Kystplanterne. — Foredragsholderen fremlagde en Tegning af en Rodstok af *Zostera*, og tydede denne som Bevis paa, at denne Plante producerer et langt større Antal Blade aarlig, end der tidligere var antaget.

I Anledning af Dr. *Petersens* Foredrag fremhævede Dr. *Kolderup Rosenvinge*, at de statistiske Beregninger over Algemængden ved de franske Kyster giver et langt mindre Beløb end det virkelige; dels tages Algerne kun paa visse Aarstider og kun paa de mere tilgængelige Steder, dels er det kun de til Formaalet passende Former, der tages. Paa Forespørgsel af Foredragsholderen oplyste Dr. *F. Børgesen*, at der er betydelige Mængder af Alger i tropiske Farvande. Dr. *Th. Mortensen* bemærkede, at der ogsaa er betydelige Mængder af Havgræs i tropiske Farvande, som afgiver Næring for Søkøer og Havskildpadder. Dr. *Ostenfeld* mente, at man ved ligefrem at afmeje *Zostera*'en maatte kunne faa direkte Bevis for, hvormange Blade den producerer aarlig.

Den 19. Januar 1912. Professor *Jungersen* holdt Foredrag om en Snyltekrebs med en epizoisk Hydroid. (Se Afhandlingen i dette Bind). Dr. *Mortensen* spurgte om, hvorledes Hudskiftet kunde foregaa hos indborede Snyltekrebs. Foredragsholderen bemærkede dertil, at der intet Hudskifte foregaar efter Indboringen: Chitinen udspiles og voxer ved Intussusception, saa Dyrets Vækst kan foregaa uden Hudskifte. Dr. *Bøving* spurgte om, hvorledes den epizoiske Goplepolyp kunde tænkes at faa sin Næring. Foredragsholderen mente, at det maatte ske gennem Munden: da den sidder paa en Chitinflade, kan det næppe tænkes, at det kan ske gennem Hydrorhiza.

Den 2. Februar. Referatmøde. Dr. *Mortensen* gav Referat af Prof. *Walcott's* Undersøgelser over cambriske Forsteninger („Cambrian Geology and Paleontology". Smithson. Miscell. Coll. Vol. 57.

No. 2, 5). I Tilslutning hertil omtalte Docent *J. P. Ravn*, hvad der hidtil kendes af præcambriske Forsteninger. Endvidere foreviste Dr. *Mortensen* nogle mærkelige Echinodermlarver (*Auricularia „nudibranchiata“* fra Japan). Mag. sc. *Hj. Ditlersen* gav Meddelelse om Eddikeaalens (*Anguillula aceti*) Optræden i det frie, i udflydende Saft af Træer. Professor *Jungersen* foreviste nogle Snyltekrebs af Lernæernes Familie (*Lernæonicus sprattæ* og *L. encrassicholi* samt *Peroderma bellottii*) og refererede *Quidor's* Opfattelse af Dværghannernes Omdannelse hos Lernæopodider og Chondracanther (C. R. 1811). Dr. *V. Nordmann* foreviste *Panopea norvegica* fra Dansk Farvand.

Den 16. Februar. Dr. *Th. Mortensen* holdt Foredrag om *Tjalfiella tristoma*, en fastsiddende Ribbegople fra Grønland. (Se „Ctenophora“, the Danish „Ingolf“-Expedition. V. 2. 1912). Professor *Jungersen* bemærkede, at Slimafsondringen hos *Tjalfiella* kunde muligvis være Værn mod *Umbellula's* Nældeceller, samt gjorde i Anledning af *Tjalfiella's* Regenerationsevne, opmærksom paa *Lang's* Afhandling om *Gastroblasta Raffaellii*.

Den 1. Marts. Lærer *J. P. Kryger* gav Meddelelse om *Oophthora*, en Slægt af de trimere Chalcidiers Gruppe. Mag. sc. *K. Henriksen* gjorde i Anledning heraf opmærksom paa nogle Undersøgelser af *Silvestri*, som ligeledes har iagttaget det mærkelige Forhold, at der baade er vingede og uvingede Hanner hos denne Slægt, medens det omvendte er Tilfældet hos *Prestwichia*.

Dr. *Th. Mortensen* gav Meddelelse om nordiske Ribbegopler. (Se „Ingolf“ Ctenophora. Part. II.).

Den 15. Marts. Dr. *C. Wesenberg-Lund* holdt Foredrag om Parrings- og Æglægningsforholdene hos Guldsmedene. (Vil blive publiceret i Internat. Revue d. ges. Hydrobiol. u. Hydrographie. 1913).

Den 29. Marts. Referatmøde. Cand. mag. *H. Blegvad* foreviste nogle smaa Aalelarver fra Atlanterhavet (se Afhandlingen i dette Bind). Mag. sc. *Ferdinandsen* holdt Foredrag om vort nuværende Kendskab til de saakaldte *Ambrosia*-Svampe (Svampe som dyrkes af Termiter, Myrer o. a.). Docent *Stamm* foreviste en Samling Æg af Havtæger (*Halobatidae*), som var fundne fæstede til forskellige i Havet drivende Genstande, saasom en Sepiaskal, en Korkstump, en Fjer o. l., og, tildels for mange Aar siden, var hjembragte til Zoologisk Museum: desuden en i Privateje beroende Terne (*Anous stolidus* [L]), som var skudt i November 1911 i det røde Hav; dens Halefjer var besatte med Hundreder af Æg af samme Størrelse og Udseende som de førnævnte og derfor uden Tvivl ligeledes tilhørende en Havtæge. Dr. *Th. Mortensen* foreviste en mærkelig Holothurie (*Rhopalodina*). Docent *J. P. J. Rørn* holdt Foredrag om præcambriske Forsteninger.

Den 19. April. Professor *V. A. Poulsen* gav Meddelelse om den anatomiske Bygning af Løgkagen af *Urginea maritima*.

Docent *A. Krogh* gav Meddelelse om Undersøgelser over Blodets Kredsløb. (Se Afhandlingen: Measurements of the Blood Flow through the Lungs of Man, by *August Krogh* and *J. Lindhard*. Skandinavische Arch. f. Physiologie. Bd. XXVII. 1912).

Beretning om de i Sommeren 1912 af Dansk naturhistorisk Forening foretagne Excursioner.

2.—3. Juni. Ornithologisk Excursion til Faaborg og Omegn, sammen med Dansk Ornithologisk Forening; under Ledelse af Overlæge *O. Helms*.

Man rejste fra København Søndag Morgen d. 2. Juni; undervejs stødte Deltagere fra andre Egne af Landet til, og Kl. 1½ mødtes Selskabet i Korinth med de fynske Fuglevenner, som havde paataget sig at fremvise Egnens Fugleliv for de to Foreninger.

Med stor Elskværdighed havde de fynske Værter stillet Vogne til Raadighed for Deltagerne, som nød en prægtig Køretur gennem Brahetrolleborgs og Holstenshus' Skove til Faaborg. Vejret var det skønnest tænkelige, og talrige Fugle saas og hørtes undervejs:

Vibe (*Vanellus cristatus*), Ringdue (*Columba palumbus*), Spurvehøg ♀ (*Astur nisus*), Gøg (*Cuculus canorus*), Forstuesvale (*Hirundo rustica*), Hvid Vipstjert (*Motacilla alba*), Skovpiber (*Anthus trivialis*), Lærke (*Alauda arvensis*), Tornsanger (*Sylvia cinerea*), Havesanger (*Sylvia hortensis*), Gulbug (*Hypolais icterina*), Løvsanger (*Phyllopseustes trochilus*), Grøn Løvsanger (*Phyllopseustes sibilatrix*), Rødhals (*Erithacus rubecula*), Musvit (*Parus major*), Sortmejse (*Parus ater*), Halemejse (*Parus caudatus*), Bogfinke (*Fringilla coelebs*), Gulspurv (*Emberiza citrinella*), Spurv (*Passer domesticus*), Stær (*Sturnus vulgaris*), Raage (*Corvus frugilegus*) og Krage (*Corvus cornix*).

I Price's Have lige ved Faaborg indtoges en lille Forfriskning, hvorefter man tilfods begav sig over „Sundet" ved Faaborg ned til Havnen. Undervejs holdt Overlæge Helms et interessant Foredrag om Sundets tidligere og nuværende Fugleliv: Jagten er nu lejet af en lille Forening af stedlige Fuglevenner, som freder Stedet. Desværre findes Rørdrummen, der tidligere opholdt sig her, ikke mere, men man haaber, at den igen vil sætte Bo, naar her som nu er uforstyrret Fred. Rørbevoxningen var saa høj, at Fuglene var vanskelige at se, men nogle saas og hørtes dog.

Stokand (to Hanner og en Hun svømmende med Ællinger) (*Anas boscas*), Hættemaage (*Larus ridibundus*), Dværgtærne (*Sterna minuta*), Stork (*Ciconia alba*), Vibe (*Vanellus cristatus*), Digesvale (*Hirundo riparia*), Mursejler (*Cypselus apus*), Hvid Vipstjert (*Motacilla alba*), Rørsanger (*Acrocephalus arundinaceus*), Rørspurv (*Emberiza schoeniclus*).

Ved Ankomsten til Havnen viste det sig nødvendigt paa Grund af Blæst og Højvande at gøre en lille Forandring i Planen, saaledes at den ventende Damper i Stedet for at sejle til Bjørnø, som Hensigten havde været, førte Deltagerne ud til nogle smaa Holme Øst for samme, hvor man gik fra Borde i de der ventende Baade.

Paa Holmene fandtes ynglende Storm- og Hættemaager (*Larus canus* og *ridibundus*), Hætte- og Kysttærner (*Sterna hirundo* og *macrura*) samt Strandskade (*Hæmatopus ostrilegus*); Raage (*Corvus frigilegus*) og Digesvale (*Hirundo riparia*) saas flyvende over.

Ved Tilbagekomsten til Faaborg havde man saa god Tid inden Middagen, at det viste sig muligt at aflægge et Besøg paa Faaborg Museum, hvor man bl. a. havde Lejlighed til at beundre en Del af Johannes Larsens smukke Billeder af Fugle.

Paa Hotellet indtoges derefter Middagen og ved Kaffen og Cigaren havde man endnu den Nydelse at se Lysbilleder af Direktør Rubows smukke Maagefotografier fra Egholm. Hr. Rubow havde været saa venlig at paatage sig den Ulejlighed at medbringe Billederne, og bistaaet af stedlige Lyskræfter skaffede han saaledes Deltagerne en Fornøjelse i Tilgift, som paaskønnedes meget.

Man gik tidlig til Ro, dels i Hotellet, dels hos Medlemmerne rundt i Byen, som med stor Gæstfrihed havde aabnet deres Hjem for de Tilrejsende, og næste Morgen Kl. 9 mødtes man paany ved Havnen for at sejle ud til Sanatoriet ved Nakkebølle Fjord. Desværre regnede det temmelig stærkt under Sejlturen, men ved Ankomsten derud var Regnen heldigvis ophørt, og Selskabet modtoges med største Gæstfrihed af Overlæge Helms og hans elskværdige Familie. Efter at Overlægen havde budt Velkommen paa Sanatoriets Enemærker og sagt nogle forklarende Ord om det Fugleliv i Skov og Park, som Deltagerne skulde have Lejlighed til at se, delte man sig i to Hold og krydsede i et Par Timer rundt i Egnen. Det var fornøjelige Ting, man fik at se, og navnlig fik man et godt Indtryk af, hvor let det er at knytte Fugleliv til sig, naar man vil gøre lidt derfor. Desværre forbød Vejret og Tidens Knaphed en længere Udflugt til den inddæmmede Del af Nakkebølle Fjord. Hvad angaar de iagttagne Arter henvises til *O. Helm*'s Artikel „Lidt om Ynglefuglene paa Sanatoriet ved Nakkebølle Fjord i Foraaret 1012"; Dansk Ornithol. Forenings Tidsskrift, 6. Aarg. H. IV. p. X.

Kl. 12 samledes man hos den utrættelige Vært og Værtinde til Frokost, og med taknemmelige Følelser mod de fynske Værter kørte Deltagerne derefter i de ventende Vogne til Pejrup Station for med Jærnbanen at spredes igén over Landet, hver til sit efter et Par Dages behageligt Samvær. *E. L. S.*

Den 9. Juni. Excursion til Grib Skov. Emne: Myreboer og Myregæster. Ledere: Mag. sc. *K. Henriksen*, Lærer *J. P. Kryger* og Partikulier *J. P. Johansen*.

Deltagerne (18) samledes i Hillerød og kørte med Vogne til Grønholtvang, hvor Boerne af den mørkebrune *Formica fusca* (under Sten) og den

begsorte, aromatisk lugtende *Lasius fuliginosus* (udgnavet i et endnu levende Træ) iagttoges. Navnlig det sidste Sted fandtes der ved Sigtning i Boets nærmeste Omkreds foruden Myrmekophiler adskillige Skovbundsdyr (*Campodea* o. a.). Af Myrmekophiler fandtes hos *L. fuliginosus* følgende Biller: *Myrmedonia humeralis* og *laticollis*, *Oxypoda notata* og *ferruginea*. — Vognene kørte derpaa Deltagerne til Nøddebo Kro, hvor der spistes Frokost. Derfra gik Turen til Fods op i Grib Skov, hvor man i Skovbrynet ud mod en Mark undersøgte Tuer af *Formica pratensis*, en mørk Race af den almindelige røde Tuemyre, *F. rufa*, og ligesom denne samlende en Stak, men ikke saa høj, af Grannaale over de i Jorden gravede Gange, hvori fandtes *Polyxenus* og mange myrmekophile Biller: *Thiasophila angulata*, *Nototheeta flavipes* og *anceps*, *Homalota talpa*, *Oxypoda hæmorrhoa*, *Dendrophilus pygmæus*, *Myrmetes piceus*, *Myrmecoxenus subterraneus* og *Platyarthrus Hoffmannseggi*, samt den lille Myre *Formicoxenus nitidulus*, der anlægger sit — uafhængige — Bo inde i Tuemyrens Tuer. — Samme Sted fandtes under Sten Boerne af den lille gule *Lasius flavus* og af Stikmyren *Myrmica rubra*.

Hos vore danske Myrer findes en 4de Type at bygge paa, de med Tiden ret kompakte Jordtuer, som *Lasius niger* og *flavus* danner paa Enge med rig Græsvæxt; men af den saas paa Grund af den knappe Tid ikke gode Exempler.

Ved Bankning paa Egene fandt man derimod adskilligt interessant: saaledes forskellige Sommerfuglelarver, belagt med Æg eller Larver af Snyltefluer (Tachiner).

Efter et fornyet, men kort Ophold i Nøddebo Kro sejlede man med Motorbaaden til Fredensborg, hvorfra Deltagerne med Toget tog tilbage til København.

K. H.

Den 25. August. Excursion til Storebælt med Biologisk Stations Damper „Sallingsund", under Ledelse af Direktør for Biologisk Station, Dr. *C. G. Joh. Petersen*.

Deltagerne (16) gik ombord i „Sallingsund" i Nyborg ved 12-Tiden. Man sejlede først til „Hvide Grunde", hvor der fiskedes med Tobis-Vaad paa Zostera-Bund. Udbyttet af denne Fangst var *Gobius flavescens*, Tangsnarre, Hundestejle, forskellige Naalefisk, Aal; *Idotheu* og *Rissoa* — en typisk Zostera-Fauna, hvoriblandt dog savnedes enkelte Former, som den lille *Psammechinus miliaris*, der andetsteds kan findes i uhyre Masser i Zostera'en.

Paa nogle Fiskekroge, der i Forvejen var udsatte af Stationens Mandskab, røgtedes nu og gav en interessant Fangst af Torsk, Hajer (*Acanthias vulgaris*), Rokker (*Raja radiata*), samt store Søstjærner (*Asterias rubens* og den pragtfulde Søsol, *Solaster papposus*).

Man sejlede derefter længere ud i Bæltet, hvor der foretoges Skrabninger paa forskellig Slags Bund til Paavisning af Fauna'ens forskellige Karakter paa haard og blød Bund. Paa den haarde Bund fandtes særlig Svampe, Balaner, *Buccinum*, Pagurer, Hydroider, Capreller, og især Echi-

nodermer: *Strongylocentrotus drøbachiensis, Cribrella sanguinolenta, Solaster papposus* og *Ophiopholis aculeata*. — Paa den bløde Bund, med megen død Zostera, fandtes *Astarte compressa* og *elliptica, Cyprina islandica, Leda* sp., *Doris* sp., *Diastylis Rathkei* og forskellige Orme, Skælrygge, *Nephthys*, Rørorme. Bundprøver toges med Bundhenteren, til Paavisning af Mængdeforholdet af de forskellige paa den bløde Bund levende Dyr; det viste sig, at de to *Astarte*-Arter var langt de talrigste, idet de fandtes i uhyre Masser i hver Prøve.

Et Træk med Togg-Vaad gav kun ringe Udbytte: en Mængde smaa Isinger, men kun en enkelt større Ising og Rødspætte. Tidligere var her Mængder af store Rødspætter, men de er nu helt opfiskede ved det intense Fiskeri, der har været drevet i Bæltet i de senere Aar. Prøver af Plankton toges, men det viste sig at være fattigt, indeholdende væsentlig kun *Ceratium tripos* og nogle Smaagopler.

Efter Afslutningen af Undersøgelserne sejledes der til Korsør, hvor Deltagerne landsattes i rette Tid til at naa Iltoget til København.

Denne Tur havde særlig Interesse ved Sammenligningen mellem Storebælts og Øresunds Fauna, hvilket sidste man havde Lejlighed til at lære at kende ved Excursionen med „Sallingsund“ i 1910. At Sundets Fauna er langt den rigeste har jo sin naturlige Forklaring i, at den dybe Østerrende i Kattegat fortsætter sig direkte ned i Øresund, helt til Hven, saa hele den rige Fauna fra det dybe Kattegat har fri Adgang hertil — medens Storebælt og hele det sydvestlige Kattegat ved grundere Vand er adskilt fra det østlige Kattegat, saa en hel Række af de i det østlige Kattegat forekommende Former er afskaarne fra at komme ned i Storebælt.

Foreningen kan ikke noksom udtrykke sin Erkendtlighed for den Adgang, Dr. *Petersen* har ydet og forhaabentlig ogsaa i Fremtiden vil yde Medlemmerne til at lære vor marine Fauna og vore Farvandes Biologi at kende, hvilket ellers kun de færreste har Adgang til.

Th. M.

Den Schibbyeske Præmie.

Præmien for 1912 er ikke bleven uddelt, da intet af de indleverede (geologiske) Arbejder fandtes egnede til Prisbelønning.

On a new Gymnoblastic Hydroid *(Ichthyocodium sarcotretis)* epizoic on a new Parasitic Copepod *(Sarcotretes scopeli)* infesting *Scopelus glacialis* Rhdt.

By

Hector F. E. Jungersen.

(With Pl. I and II.)

About two years ago one of my pupils, Mr. Blegvad — now Cand. mag. — handed over to me a specimen of *Scopelus glacialis* with a most remarkable parasite, asking me what the latter might likely be. The fish with the strange guest had been captured in August or September 1906 in the depth of the Atlantic off the S. W. coast of Ireland by the Danish steamer "Thor", on an investigation cruise in which Mr. Blegvad took part as assistant naturalist. I was not able to answer the question immediately and laid the specimen aside for closer examination later. This examination I have only recently found time to make. The parasite (Pl. I. Fig. 1) at first sight appears made up of a stem and a large number of branchlets. The stem is stout, when viewed with a strong lens densely striated transversely; it narrows somewhat abruptly into a short slender stalk inserted into the body of the fish. Both sides and the face looking towards the fish are covered with a great number of quite soft structures resembling papillæ; the whole thing bears a superficial likeness to an "*Eolis*". At first I thought it might be a *Pennella*, but the soft and irregularly grouped papillæ did not show any great likeness to the firmly cuticularized. branched and symmetrically arranged appendages of a *Pennella*. Closer examination of some of the larger and stouter "papillæ", which had fallen off from the sides of the stem, revealed the structure of Medusæ, and a slender "papilla" from the inner face

of the parasite turned out to be a Polype with medusæ-buds in various stages of development. Thus the question evidently was of some colony of Hydroids; but the stem soon turned out to be, not a part of a Hydroid, but of a Parasitic Copepod, belonging to the family of *Lernæidæ*. Without destroying the beautiful specimen given by Mr. Blegvad, I reached this conclusion from a thorough search for parasites in the rich collection of *Scopelini* from the Atlantic, which our Museum had obtained from the steamer "Thor". More than two thousand specimens of *Scopelini* were examined for this purpose; I succeeded in finding 6 other specimens of the "combined parasite"; some of these had egg-strings — or remnants of egg-strings — still adhering, and thus did not leave any doubt about the nature of the "stem". The new material did not contain any specimen so richly developed as the first one, but on the other hand it yielded developmental stages both of the Hydroid and of the Parasitic Copepod. Especially the latter seem to me of some value as a supplement to what has been known hitherto of the metamorphosis of some other *Lernæidæ (Lernæa, Pennella)*.

My material, further, shows that the association of the Hydroid with the Parasitic Copepod is not a "necessary" one, in so far that the parasitic Crustacean may be found without the Hydroid; on the other hand, I never found the Hydroid without the Copepod, though the fact is not unknown that some Hydroids grow directly on the body of fishes (2; 7 a, b; 13; 20 a; 8, 9).

That the association is not an accidental one seems to be proved by the fact that a proportionally large number of the Parasitic Copepod carry the Hydroid. 22 specimens of the Copepod in its final form, inserted into the body of the fish, were found; but of these 8 are very young and the part protruding outside the fish is so small, that it could not be expected beforehand, that any Hydroid should attach itself upon it; of the remaining 14 large and adult specimens just half the number bear the Hydroid.

The Copepod, consequently also the association, appears to be bound to a single species of host, *Scopelus glacialis* Rhdt.; and

only on the same fish have been found all the developmental stages which precede that of insertion into the body of the host. As already mentioned I have examined a great number of *Scopelini* and allied forms from the Atlantic, between 2 and 3 thousand specimens, but I have never found this parasite — nor any other Parasitic Copepod — on other species of the genus *Scopelus* (taken in its widest sense as comprising *Rhinoscopelus*, *Myctophum* etc.) nor on species of genera like *Cyclothone*, *Argyropelecus*, *Maurolicus*, *Stomias* etc., which were captured by the "Thor" often in numbers together with *Scop. glacialis* on the same stations. The parasite in question has only been taken by the "Thor" in the part of the Atlantic lying between 48° 15′ Lat. N. and 65° Lat. N., and between 4° 33′ Long. W. and 28° 10′ Long. W., always in a considerable depth — from 100 to 600 met. below the surface. By the ship "Tjalfe", on a surveying expedition to the Greenland waters under supervision of Mr. Ad. Jensen, only a single (young) specimen was captured farther west, sc. at 48° 26′ Long. W., 60° 07′ Lat. N. In the Davis-Strait it seems not to occur; among some 330 specimens of *Scop. glacialis* collected by the "Tjalfe" W. of Greenland, between ca. 63° and 71° Lat. N., none were found infested. In collections made by the "Thor" in the Atlantic south of the above named boundary I did not find the parasite; and it is likewise wanting on the numerous *Scop. glacialis* collected by the "Thor" in the Mediterranean. In the latter this fish and — less often — two other species of *Scopelus* were found infested with an allied Parasitic Copepod *Peroderma bellottii;* but on this I never found any Hydroid.

That our parasite is by no means of frequent occurrence seems to be proved by the fact that to yield the 22 above-named specimens more than 1800 specimens of *Scopelus glacialis* had to be examined.

For the sake of completeness all the localities for the material examined are given below.

1. The association of the Parasitic Copepod with the Hydroid.

"Thor"s Station No.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
286.	61° 49′	14° 11′	1000	400	2/9 04.
164.	61° 20′	11° 00′	1300	150	29/8 05.
124.	61° 04′	4° 33′	1075	500	23/7 05.
89.	55° 45′	9° 35′	1600	100	23/6 06.
185.	51° 56′	11° 55′	350—640	150—450	8/9 06.
93.	49° 23′	12° 20′	ca. 1300	100	5/6 05.
?	S. W. of Ireland		?	?	? 06.

2. The Parasitic Copepod, without the Hydroid.

"Thor"s Station No.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
152.	65° 00′	28° 10′	1240	400	19/6 04.
286 (2 spec.).	61° 49′	14° 11′	1000	400	2/9 04.
124.	61° 04′	4° 33′	1075	500	23/7 05.
89.	55° 09′	9° 35′	1600	100	23/6 06.
182.	50° 11′	12° 05′	2200	150	4/9 06.
76 (3 spec.).	49° 27′	13° 33′	2600	400	11/6 06.
93.	49° 23′	12° 20′	ca. 1300	100	5/6 05.
88 (2 spec.).	48° 09′	8° 30′	600	150	20/6 05.
87.	48° 05′	8° 29′	2000	150	20/6 05.
"Tjalfe"s St.No.					
321.	60° 07′	48° 26′	? (but more than 2000)	300	3/5 09.

3. Stages of Development of the Parasitic Copepod (Cyclops-stage and Pupæ)

"Thor"s Station No.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
	A. (Cyclops-stage).				
80.	51° 34′	11° 50′	1140	500	16/6 06.
93 (2 spec.).	49° 23′	12° 20′	ca. 1300	100	5/6 05.
	B. 1st Pupal Stage.				
285.	62° 49′	18° 46′	1000	250	1/9 04.
80.	51° 34′	11° 50′	1140	500	16/6 06.
93.	49° 23′	12° 20′	ca. 1300	100	5/6 05.
63.	48° 09′	8° 36′	?	?	?
	C. 2nd Pupal Stage.				
88.	55° 05′	12° 20′	2000	100	22/6 06.
177.	49° 30′	11° 38′	550	150	1/9 06.
76 (4 spec.).	49° 27′	13° 33′	2600	400	11/6 06.
178.	48° 04′	12° 40′	4000	500	2/9 06.

"Thor"s Station No.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
	D. 3rd Pupal Stage.				
152.	65° 00′	28° 10′	1240	500	19/6 04.
285.	62° 49′	18° 46′	1000	?	1/9 04.
88.	55° 05′	12° 20′	2000	100	22/6 06.
80.	51° 34′	11° 50′	1140	500	16/6 06.
175.	51° 11′	11° 41′	575	100	30/8 06.
76.	49° 27′	13° 33′	2600	400	11/6 06.
93 (2 spec.)	49° 23′	12° 20′	ca. 1300	100	5/6 05.
	E, 4th Pupal Stage.				
230.	63° 10′	7° 31′	1090	600	3/8 04.
88.	55° 05′	12° 20′	2000	100	23/6 06.
76 (3 spec.).	49° 27′	13° 33′	2600	400	11/6 06.
93 (7 spec.).	49° 23′	12° 20′	ca. 1300	100	5/6 05.

I. The Parasitic Copepod.

1. The adult female (Pl. I, Figs. 7—10).

The female parasite is sunk into the body of the fish, leaving outside of the host its posterior part, which is larger or smaller according to the age and development of the parasite. The infested *Scopelus glacialis* are from 20 to 57 mm. in length, mostly less than 30 mm. In most cases the parasite is seen projecting from the dorsal part of the fish (i. e. above the lateral line), most often in front of the dorsal fin (of the 22 specimens 16 penetrate dorsally, of these again 13 in front of the dorsal fin; 6 are attached ventrally). The greater number is found on the right side (11 on the right, 7 on the left side, 4 just in the middle line). With its anterior part it penetrates through the body wall to the intestines of the host; the posterior, visible part is largest and stoutest in egg-bearing individuals, but the length of the hidden, internal part does not always correspond to that of the external: to reach the intestines the individuals which protrude near the dorsal middle line, especially those fixed behind the dorsal fin, have a longer way to penetrate than those attached ventrally. In egg-bearing females the external part is generally club-shaped; near

the surface of the fish it narrows more or less abruptly into a slender stalk, sunk through a kind of vault of the skin deeper into the tissues of the host; in length it varies from 3 to 7 mm., with a largest diameter of from 1,5 to 2 mm. The position of the genital openings, carrying the egg-strings, shows that the ventral side of the parasite looks towards the surface of the fish. The egg-strings seem rather variable in length: in one specimen, the external part of which measured 4 mm. in length, 1,5 mm. in breadth, they were only 7 mm., although quite complete; in another specimen, where the external part measures 7 mm. in length, the egg-strings — though deprived of their outer ends — are 22 mm. They are cylindrical, the eggs flat, arranged in a single row like coins in a rouleau, — as in other *Lernœidæ*. The eggs are light yellow or greenish-yellowish. The external part of the parasite is generally somewhat chocolate-coloured from brown pigment, arranged in smaller or larger specks and longitudinal stripes. Young individuals, still without eggs, appear unpigmented, whitish. Through the cuticle part of the intestine, the ovaries, oviducts and cementing glands may be seen. The part hidden in the tissues of the host is yellowish with numerous drops of oil shining through. The length and shape of this internal part varies a good deal. One specimen, projecting near the middle line of the back in front of the dorsal fin of a fish of 42 mm. length, reached through the muscles, past the vertebral column, between two ribs to the small intestine; its total length is ca. 13 mm., 7 hidden in the fish, 6 external; the part passing the muscles form a slender stalk of ca. 5 mm. length. Of another specimen, ca. 9 mm. in total length, and attached between the right ventral fin and the posterior pectoral light-spot of a *Scop. glac.* 33 mm. in length, about half the length appeared externally, but the slender stalk which had only a thin layer of muscles to penetrate, has only a length of 0,6 mm. Just inside the body wall the parasite broadens evenly towards the anterior end; following the curvature of the posterior appendix pylorica it reached under the air-bladder and right lobe of the liver to the

oesophagus. A third individual (still unpigmented and without eggs), fixed near the back on a line with the root of the pectoral fin of a fish, 55 mm. in length, only protruded with 4,8 mm. externally, while 8,2 mm. were hidden in the host. It went nearly straight down through the muscles, curved in front of the right pronephros over the upper pharyngeal bones and had its anterior end lying in front of the left pronephros, with the sucking apparatus close to the jugular vein. The greater part of the internal portion of this specimen is narrow and slender.

In all specimens examined the anterior part sends out from each side a large, clumsy process, generally shaped like a cushion (Figs. 7, 8, pr.); sometimes more as a sausage (Fig. 10 pr.); behind the processes follows an elongated, straight or curved portion, tapering gradually into a stalk and at the same time acquiring a more and more thick cuticle; outside the host it widens — sometimes abruptly — into the ovoid part, carrying the genital openings with the egg-strings. Behind the latter a short conical part may be more or less pronounced and feebly bent dorsally.

The anterior part with the two large lateral processes is the cephalothorax; in front of the processes are seen two pairs of antennæ, the mouth-sipho, maxillæ and one pair of maxillipeds (according to some authors = the second pair of maxillæ); immediately behind the cephalothorax a very short part of the elongated portion represents the abdomen (or thorax), composed of three, still quite discernible segments; the two anterior of these are provided each with a pair of feet, while an anterior pair of feet takes origin from the cephalothorax. By far the greatest portion of the whole parasite is made up by the enormously developed genital segment, as in other *Lernæidæ;* the remaining part of the postabdomen, probably only representing a single segment, is the above-named small conical end.

Closer examination of the anterior part shows that most of the Copepod-structure is pretty well preserved; the shape of the dorsal shield is quite recognizable; below its anterior margin a

longitudinal thickened ridge to strengthen the antennæ runs from the base of the latter to below the antennules: from here a similar, but longer and curved, thickened line runs up over part of the dorsal shield towards the middle line, without reaching its fellow from the opposite side (*l*, Fig. 8). No eyes are visible.

The antennules (a_1) are short, indistinctly segmented (probably 4 segments), along the front margin and at the distal end provided with setæ; especially the distal ones are fairly long. The antennæ (a_2) are cheliform, composed of 3 segments. The basal segment is strengthened by chitinous ridges; the terminal segment or movable finger of the chela is sickle-shaped, its point acting against a fairly strong process from the middle segment; the latter has between this process and the articulation for the terminal claw a thin low crest or keel. Below the front end of the cephalothorax protrudes the large sipho (*si*), strengthened at the base on each side by a chitinous ridge, running backwards past the origin of the maxillipeds (*l*, Fig. 8). The mouth-opening is funnel-shaped; the margin of the funnel appears slightly haired owing to numerous chitinous striæ radiating on its inner face; two small pointed processes project from its dorsal wall (the upper lip); besides, the points of the mandibles are seen in the interior of the sipho. The outer portion of the latter, behind the funnel, is strengthened by chitinous rings, one of which is stronger than the others.

On each side of the base of the sipho is seen the maxilla (*mx*) (maxillula), short, clumsy and ending with two strong setæ. The maxillipeds (or second pair of maxillæ) consist each of 3 segments; the front margin of the basal segment carries a denticle, about at the middle; distally on the outer side of the second segment is found a similar, but smaller denticle; the terminal segment is sickle-shaped and obliquely striated (owing to densely set hairs or lamellæ). A pair of second maxillipeds is wanting.

The large "anchor-processes" (*pr*) originate below the margins of the dorsal shield.

As in other Parasitic Copepods the foremost abdominal (or thoracic)

segment is coalesced with the cephalothorax. Three free terga for the other abdominal segments are developed, decreasing in size backwards, the hindmost being quite narrow. Generally, quite fine transverse lines may be traced from the front margins of the terga running across towards the ventral side; sometimes also a similar line may be traced from the anterior segment, coalesced with the cephalothorax.

Of the 3 pairs of abdominal (or thoracic) feet the two anterior possess two rami, the last pair only one ramus (Fig. 10). Each ramus is bisegmented. The distal segment carries 7 (that of the last pair only 6) setæ with extremely delicate plumules; the outermost seta is shorter than the rest. The proximal segment carries one seta on its inner corner; this seta is long on the outer ramus, short on the inner. The basal segment of each foot has a seta at its outer end, just outside the articulation for the outer ramus. On the ventral margin of the basal segment of the first pair, medially to the origin of the inner ramus, is found a quite short seta. As already stated, the first pair of feet originates from the cephalothorax, the second from the first free abdominal segment, the third from the second; while the third segment is without feet. Ventrally between the feet sterna are developed, with a strong transverse ridge joining the members of each pair. In front of the first pair is a Y-shaped thickening on the cephalothorax; and behind the last pair a thickened transverse line on the abdomen.

The elongated genital segment is densely striated transversely (this structure disappears on treating with a solution of potash). The genital openings are provided with strong chitinous lips (Fig. 9, *o*); between them a spot is always observed, possibly where the copulatory openings have once been (Fig. 9*). The last post-abdominal segment carries on each side of the anus a small wart, evidently the furcal appendage, but completely devoid of setæ (Fig. 9, *f*).

Young stages, still unpigmented and pale, do not project with more than ca. 0,8 to 2,5 mm. outside their host. Closer examin-

ation shows that they deviate still less from the Copepod-shape than do the adults. I shall describe these stages later, comparing them with the stages of metamorphosis which precede the state of insertion into the body of the fish.

That our parasite belongs to the family *Lernæidæ* is evident; in many points it agrees with genera like *Pennella, Lernæa, Lernæenicus* and *Peroderma*. The 3 first-named possess 4 pairs of abdominal feet, the two anterior biramous, the two posterior uniramous; for this and other reasons the new parasite will hardly be accepted into any of these genera; more likely it might be included in the genus *Peroderma*, as the latter has only 3 pairs of swimming feet; but as we shall see presently, various structural differences seem to justify the establishing of a new genus and species for our parasite. I propose for it the name: *Sarcotretes scopeli*, and give the following diagnosis:

Sarcotretes n. g. Body elongated; the middle portion of the genital segment constricted into a narrow, firmly chitinized stalk, only the distal, claviform part behind the stalk projecting outside the host; antennules linear; antennæ cheliform; one pair of maxillipeds; three pairs of abdominal feet, the two anterior biramous, the posterior uniramous; three free abdominal segments with terga and ventral sterna well developed.

S. scopeli n. sp. Cephalothorax with two large, thin-walled (ventro-) lateral outgrowths; no other outgrowths present. Dorsal shield fully preserved, oblong, with an upper chitinous curved line on each side; other chitinous stripes under the front margin, and along the base of the sipho; tergum of hindmost abdominal segment small and narrow.

Inserted into the body of *Scopelus glacialis*, the body wall of which it pierces, penetrating to the alimentary tract.

The genus *Peroderma* was established by Heller (1865, 10. p. 250) for the species *P. cylindricum* (l. c. Pl. XXV, Fig. 6), which penetrates the lateral muscles of the Pilchard in the Mediterranean. H.'s description and figure were rather incorrect and were improved

by Richiardi (1875, 18 a). In the meantime Cornalia had named the same parasite *Taphrobia pilchardi* (5) without describing it better; both Heller and Cornalia only had one specimen at their disposal, and that of Heller was damaged. Richiardi showed that this parasite at its anterior end is provided with a system of branched appendages; he described antennæ, maxillipeds, swimming-feet etc. and gave a new diagnosis of the genus. Later (1881, 12 b) Richiardi briefly described a second species, *P. petersi*, deeply implanted into the body of *Gobius buccatus* C. V., and a third one (1882, 18 c) *P. bellottii*, inserted into the branchial arterial stem of *Scopelus benoiti*. The latter species I think is identical with that figured on Pl. II, Fig. 27, as this agrees in every essential point with the short description by Richiardi (as far as I know, the more complete description and the figure promised by R. (18 c, p. 150 and 475) have never been published)[1]). I found this parasite in numerous adult specimens on *Scopelus glacialis* and *Sc. rafinesquii*, collected by the "Thor" in the western part of the Mediterranean, in, and close to, the Straits of Gibraltar (on Station 99 of 96 specimens of *Sc. glacialis* 28 were infested, of 46 specimens of *S. rafinesquii* only 3; on Stat. 59 one specimen among 149 *Sc. glacialis*, and one among 5 *Sc. rafinesquii* carried the same; and on St. 61 (in the Strait itself) one of 2 *S. rafinesquii*)[2]). It is always attached to the same spot of the host, namely under the isthmus, with the posterior end, bearing the egg-strings, pointing backwards and the ventral side looking towards the belly of the

[1]) Brian (3, p. 94) repeats Richiardi's description, and only adds the following: "Due esemplari sporgenti fuori dell' angolo boccale dello *Scop. caudispinosus* Johs. furono trovati in Genova il 18 Maggio 1908". The figures, referred to, are Pl. VII, Fig. 2, and Pl. XIX, Figs. 2—5: but what is represented there has nothing at all to do with any *Peroderma* whatsoever!

[2])

"Thor"s St. No.	Lat. N.	Long. W.	Depth of capture	Date
99.	36° 02′	5° 16′	150 Met.	$^{23}/_{6}$ 1910.
59.	36° 12′	4° 21′	9—1200 —	$^{21}/_{2}$ 1909.
61.	35° 52′	5° 35′	300 —	$^{21}/_{2}$ 1909.

fish. All specimens examined had the richly branched system of "frontal" appendages inserted into the bulbus arteriosus, the latter being distended to such degree, that it far surpassed in size the ventricle (cfr. Pl. I, Fig. 27 *b* and *v*). Nevertheless the infested specimens looked quite as healthy and well nourished as those free of the parasite.

The three species of *Peroderma* all possess branched appendages from the front end of the cephalothorax [1]). According to Richiardi's figures of *P. cylindricum* the distance between the second and third pair of swimming feet is very great, and in this interspace are found a pair of peculiar chitinous ridges; no terga of abdominal segments are mentioned or figured. Regarding *P. petersi*, which has not been figured, it is said that 4 pairs of feet are present, following each other at short distances, and that the egg-strings are "spirally directed" (after these statements the species seems to me somewhat doubtful as a member of the genus

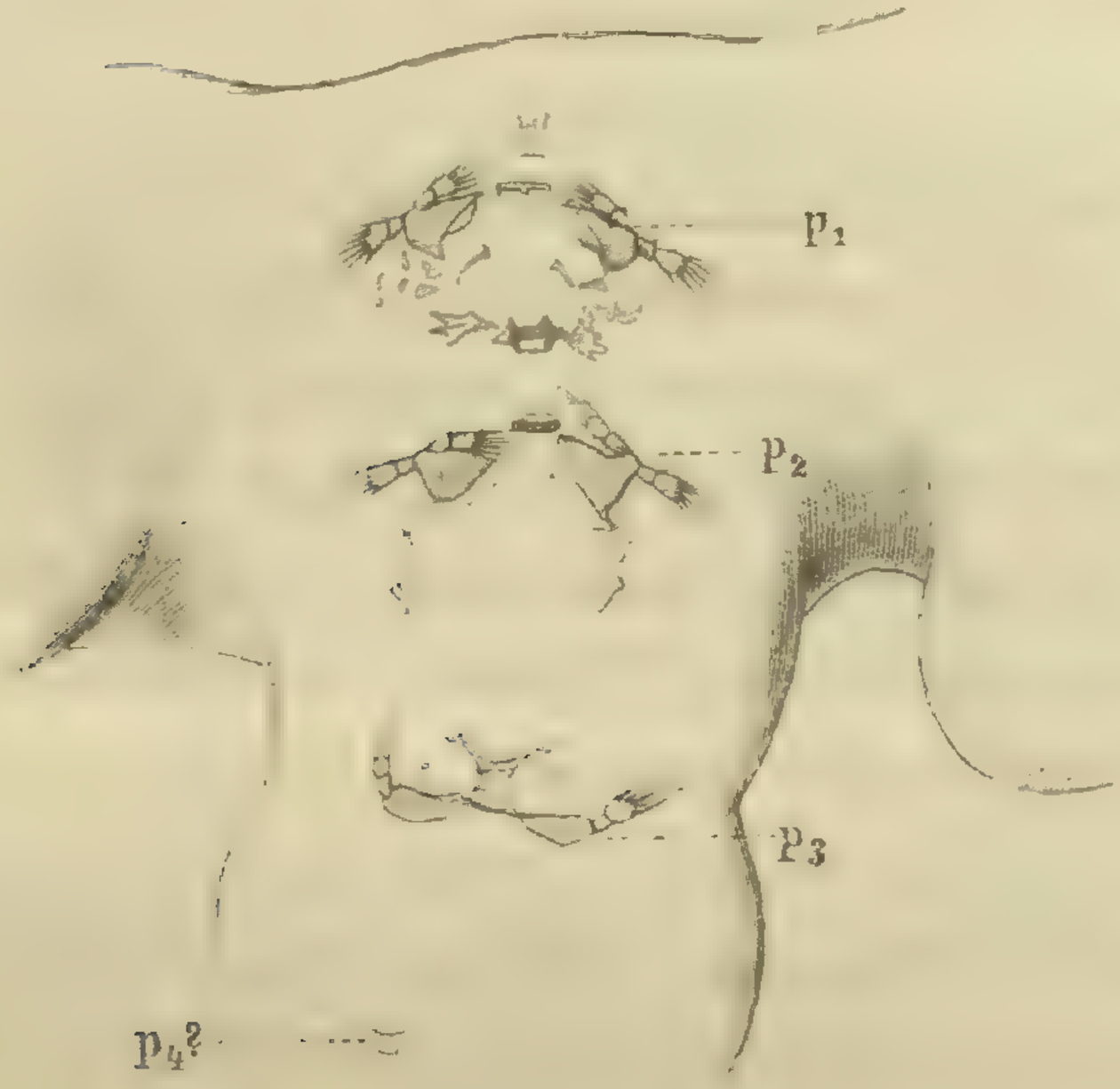


Fig. 1. *Peroderma bellottii.*
Part of ventral side of body, between the two large lateral outgrowths. p_1—p_3: first to third pair of abdominal (thoracic) feet; p_4?: rudimentary structure, perhaps representing the right foot of a fourth pair.

[1]) C. B. Wilson has (23, p. 458. Pl. LXXVI, Figs. 99—100) described a "*Lernæenicus meduscæus*" taken on *Nannobrachium leucopsarum* at Monterey, Calif., which may belong to the genus *Peroderma*, as it very much resembles *P. bellottii*. But it is said to possess only 2 pairs of swimming feet, with single rami, and the author adds: "No other appendages are visible", and that no sipho is to be seen. These statements seem to me somewhat doubtful. The place on the host is not mentioned.

Peroderma). *P. bellottii*, which I have examined myself, has only 3 pairs of feet developed; but behind the last pair a merely rudimentary structure is seen, which may perhaps represent a fourth pair. The 3 pairs are arranged with large interspaces (cfr. text-figure 1, pag. 12), in which small symmetrically scattered chitinous parcels are found, looking like ventral parts of the segments, burst from each other by the distension of the body during its growth. The feet, compared with those of *Sarcotretes*, are smaller and of a somewhat different shape, and the same may be said regarding the antennæ, first maxillipeds and sipho; further there is a vestigial pair of 2nd maxillipeds (like those of *Lernæa branchialis*) about midway between the first maxillipeds and anterior pair of feet; the dorsal shield of the cephalothorax has quite another shape, being distended and burst into pieces at the margins, probably a consequence of the greater development of the two lateral processes, which are here somewhat asymmetrical and clumsily branched at their outer ends. Only the first of the abdominal terga seems preserved; it is here asymmetrically turned to the left side on a slight swelling immediately behind the large processes. These differences together with the presence of the branched "frontal" appendages seem to me to prevent the inclusion of my *Sarcotretes* in the same genus. Speaking generally, the latter shows more likeness to the genus *Lernæenicus*, f. ex. *L. encrasicholi* (Turton) which I know from my own examination[1]); but, as already stated, this genus possesses four pairs of feet.

2. The stages of metamorphosis (Pl. II, Figs. 11-15, 22-26).

A. The youngest stage which I have found agrees in the main features with the stage of *Lernæa branchialis*, which Claus

[1]) This species has a short median outgrowth from the dorsal side of the cephalothorax about at the level of the two large lateral processes, and furthermore on the ventral side, in front of the maxillipeds a pair of short, clumsy outgrowths. These structures as well as the maxillipeds and maxillæ have been overlooked by A. Scott (19 b, p. 94, Pl. II, Figs. 6—9).

(4, p. 22, Pl. IV, Figs. 1—5) describes as "die erste Cyclopsform" (the "Cyclopid-stage" of Pedaschenko (17, p. 279)) and with the "Cyclopsform" described by Wierzejski (22, p. 571, Pl. XXXII. Fig. 4), found on the gills of Cephalopods and supposed by W. to belong to a species of *Pennella*. I only succeeded in finding 3 specimens of this stage, probably arisen from a Nauplius or Metanauplius (embryonic Naupliæ I did not find in the preserved egg-strings, and consequently I was not able to isolate any). The specimen figured on Pl. II, Fig. 11—12 was found attached to the left side above the pectoral fin of a young *Scop. glacialis*, only 12 mm. in length. The other two were both fixed on a *Scop. gl.*, 25 mm. in length, the one to the left ventral fin, the other to the left pectoral. They were all attached by means of their strong cheliform antennæ. Evidently this stage is capable of active wandering from one spot to another of its host, probably also of swimming along for a while and attaching itself again. This seems to be proved by the whole elegant Cyclops-shape, the proportionally large swimming feet, the antennules etc. The length is between 0,448 and 0,5 mm. Of the specimen figured, ca. 0,5 mm., the elongated ovoid cephalothorax makes up 0,352 mm., the rest 0,112. The rostrum is curved downwards. The antennules are provided with sense-hairs along their front margin and with long setæ distally, at least of half the length of the cephalothorax. The antennæ are strong and projecting, the stout basal segment almost vertically bent against the cephalothorax; of their three segments the basal one is nearly cylindrical and strengthened by chitinous ridges, while the remaining two form a large chela, the longitudinal axis of which is parallel to the cephalothorax. The terminal segment is a long, elegantly awl- or sickle-shaped claw with a curved point, acting against a sharply pointed process on the elongated second segment; the latter carries at some distance another somewhat smaller hook. The sipho is relatively short; laterally it carries the maxilla (*mx*) with its two stout setæ, and just above the root of the maxilla a fairly long, slender appendage ending in a single long seta (*md*); this I

take to be the mandibular palp. One pair of maxillipeds is present, strong, 3-segmented (mp_1); the basal segment has a small denticle on its anterior margin; the terminal segment is a curved, somewhat compressed claw, obliquely striated laterally. The cephalothorax is provided with chitinous thickened lines arranged as in the adult. No eyes are visible. Behind the cephalothorax are 3 distinct abdominal segments and one terminal, representing the postabdomen and bearing on each side of the anus a well developed furcal appendage with setæ (f). There are two pairs of strong swimming-feet, the anterior originating from the ventral margin of the cephalothorax, the second from the first abdominal segment. Each foot consists of a strong basal joint and two rami; each of the latter has only one segment with long setæ, provided with delicate plumules. Each furcal appendage has 4 setæ, the two inner of which, especially the innermost, are long and feathered.

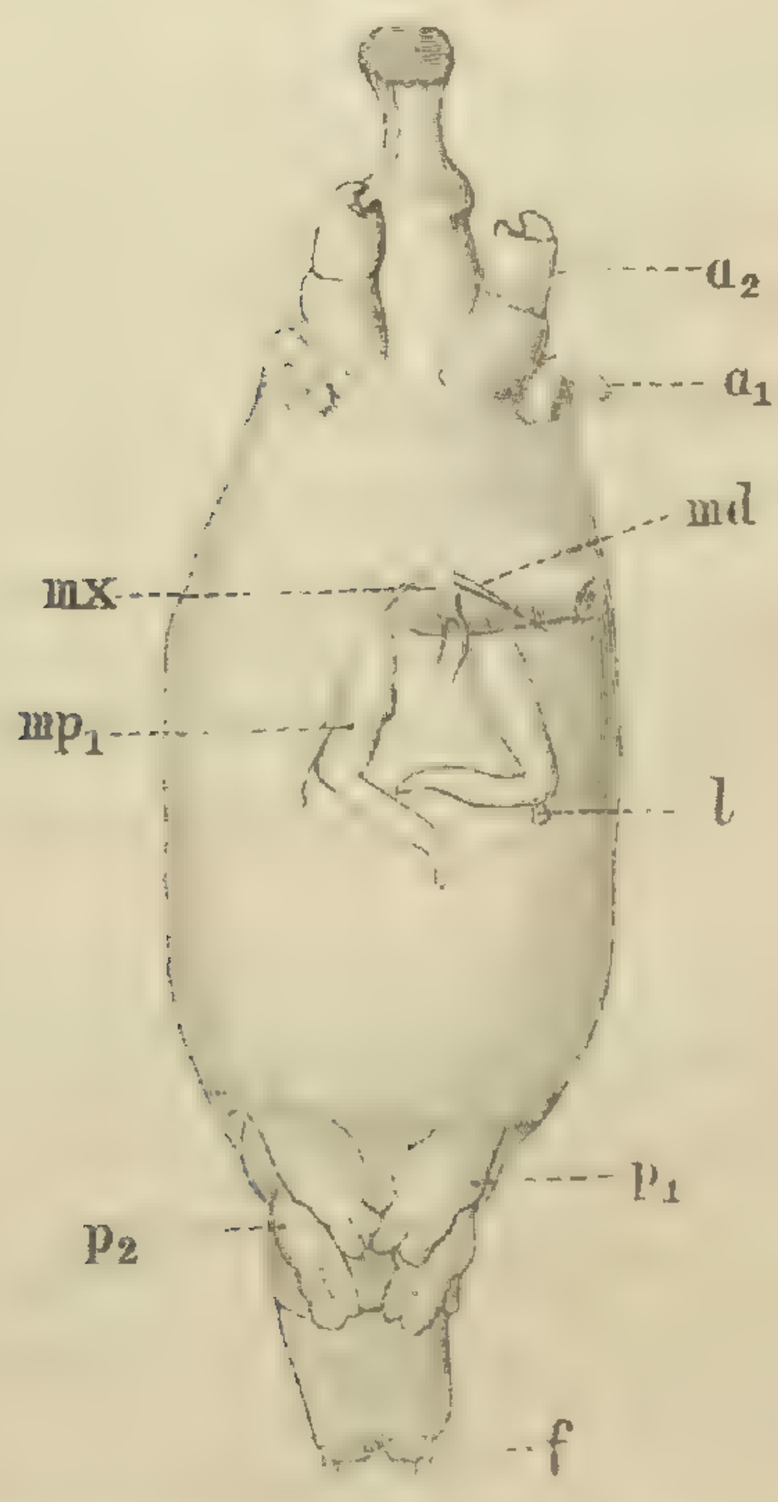
Upon this "actively fixed" stage A, the Cyclops-stage, follows a series of "passively fixed" stages, probably representing as many moultings; they may be called "Pupal stages", as Claus has done in the case of *Lernæa branchialis*, and Wierzejski with the corresponding stages of the Lernaeid, supposed to be a *Pennella*. They are more or less clumsy, with the abdominal feet adpressed and provided — like the antennules — with more or less clumsy setæ or devoid of such, according to the grade of development. The antennæ are relatively short and clumsy chelæ, situated below an elongated rostrum and evidently not fit for grasping. The fixation is brought about by the rostrum; from the end of the latter projects an appendage with a terminal disc firmly cemented to the skin of the host. This appendage is undoubtedly a hardened secretion produced by glands in the front end of the cephalothorax; it is firm like chitine, resisting like the cuticula itself the action of potash; a pear-shaped swelling marks it off from the rostrum proper. I have not been able to see any composition of layers in the. swelling, like those observed by Claus in the pupæ of *Lernæa branchialis*, where the number of moultings may be judged directly

from them; in all the present pupal stages I find the structure to be identical.

The total number of pupal specimens found is 34; according to grade of development, size, shape of the setæ etc. they may be grouped into four stages, in the following designated as B, C, D and E. The younger stages are less numerous in my material than the older. All are attached by means of their frontal appendage to *Scopelus glacialis* of 14 to 46 mm. length, mostly to young specimens below 30 mm. Generally each fish has only one pupa attached; but in one case I found two different pupal stages (B and D) fixed on the same host (on the right pectoral fin of a *Sc. gl.* of 28 mm. length), which besides had a young female inserted in front of the dorsal fin; in another case I found one pupa (D) on a *Scopelus* which also carried a young female protruding in front of the dorsal fin. In most cases the pupæ are attached to the fins (in 28 cases of the 34), and especially to one of the ventrals (in 13 out of 28 cases), rarely to the body, and in the latter case mostly to the belly in front of the ventrals; in one single case a pupa was found on the margin of the right opercle. Evidently the pupæ do not prefer the one side of the host to the other, half the number being found on the right, the other half on the left side. Their fixation is always a firm one; to liberate without damaging them it is safe to use a solution of potash. As in the adult and the Cyclops-stage no eyes are seen in the pupal stages, opposite to the case of *Lernæa branchialis* and the supposed *Pennella*-pupæ of Wierzejski.

Stage B. (Textfig. 2 and 3.) The youngest pupal stage I suppose to have been produced through the moulting of the Cyclops-stage A. It is somewhat larger than the latter, measuring from 0,7—0,8 mm. in length; the cephalothorax alone 0,5—0,6 mm. Behind the cephalothorax only two abdominal segments are seen, followed by an unsegmented part, carrying the anus and very short furcal appendages with 4 clumsy indications of setæ. The antennules are clumsy, short, without segmentation, distally provided with

some very short setæ. The antennæ do not reach to the end of the rostrum, their chelæ are weak and unfit for grasping. The sipho is very large; the maxillæ and mandibular palps well developed, the maxillipeds long, their terminal claw clumsy. In some individuals a second (posterior) pair of rudimentary maxillipeds is present; these specimens are males. Chitinous ridges on the



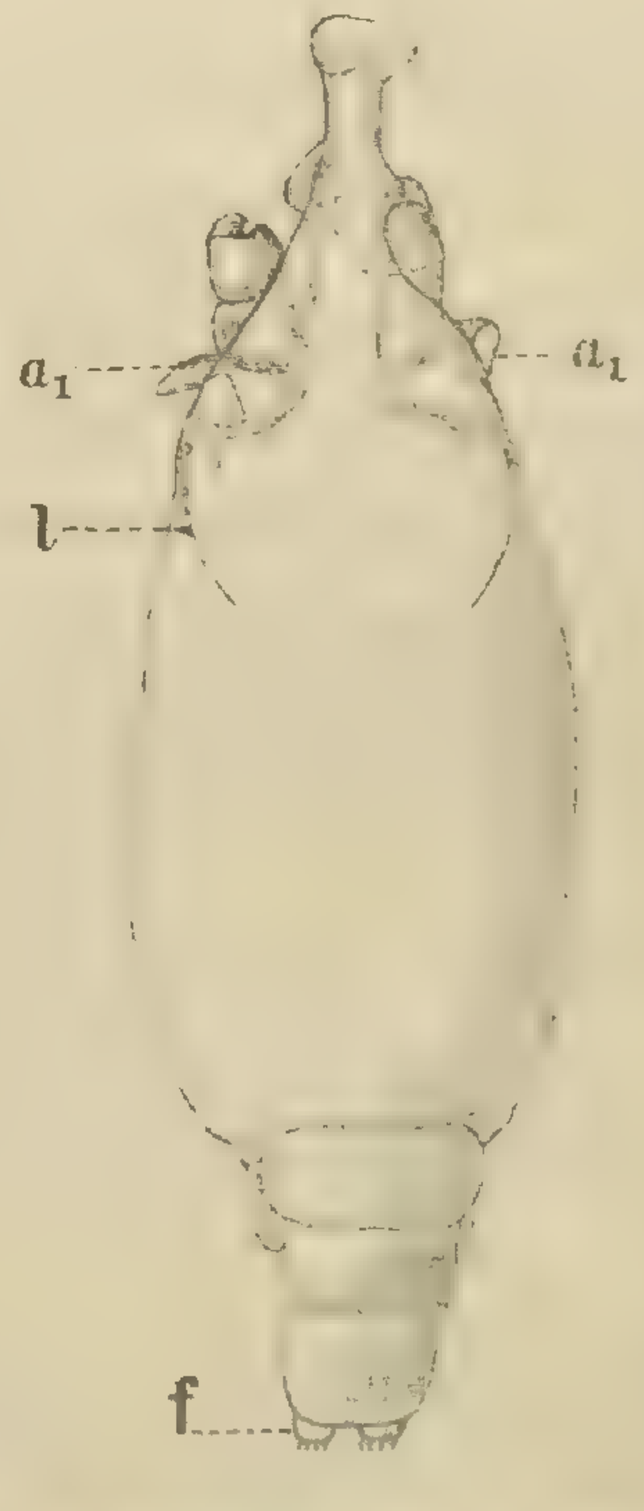


Fig. 2. First pupal stage (B) from ventral and Fig. 3 from dorsal side. a_1 antennule; a_2 antenna; *md* mandibular palp; *mx* maxilla; mp_1 first maxilliped; *l* chitinous thickenings; p_1, p_2 first and second abdominal (thoracic) feet; *f* furcal appendage.

cephalothorax arranged as in the Cyclops-stage and the adult; the same is the case with all the following stages. Two pairs of abdominal feet are present, both biramous and quite without setæ; they are not distinctly segmented but slight incisions mark off a basal portion and two parts of each ramus.

C. (Pl. II, Fig. 13.) The next pupal stage has a length of ca. 1 mm. (the cephalothorax alone being ca. 0,82 mm.). A third abdominal segment is now indicated. The antennules, antennæ etc. are in the main like those of the preceding stage, but a third pair

of abdominal feet is now present as short, flattened appendages to the second abdominal segment; a division into a basal segment and ramus is indistinctly indicated. The distal setæ of the antennules are somewhat larger, and the two biramous feet now show a set of extremely short setæ; the furcal setæ are much as in the stage B.

D. (Pl. II, Figs. 14, 23). The following stage is ca. 1,6 mm. in length (the cephalothorax 1,12 mm.) Antennules, antennæ, maxillipeds and feet are still clumsy; the abdomen has three distinct segments. Third pair of abdominal feet has about half the length of the two anterior pairs; the last abdominal segment is without feet as in the adult. The segmentation of the feet is more marked than in the preceding stage, the basal segment and two segments of the rami being now quite distinct, most so in the anterior pair (cfr. Pl. II, Fig. 23). The same number of setæ as in the adult are present, and the setæ are now much more developed but still clumsy and pressed against each other; the same is the case with those of the antennules. Male specimens show the second pair of maxillipeds (Fig. 14 mp_2) as short, bent appendages about on the level with the "elbow" of the first maxillipeds.

E. (Pl. II, Figs. 15, 24—26.) Stages of ca. 2 mm. length (the cephalothorax ca. 1,36 mm.) seem to be the last pupal stages producing the copulatory form. This may be concluded from the following observations: 1) inside the cuticle of this stage is seen a Copepod-form resembling the adult in many details; 2) a proportionally great number of specimens of this stage has been found, but not a single pupa of larger size or more developed. In this stage the general shape of the body and its appendages are less clumsy than in the preceding; all the setæ are much longer, the segmentation of the feet more pronounced; the postabdomen — including the future genital segment — is now about of the same length as the abdominal segments taken together. The setæ appear more free of each other, and those of the feet show delicate plumules at their extreme, very thinwalled ends (Textfigure 4). Enclosed below the cuticle of this pupa another Copepod-form is seen;

inside the pupal antennæ is distinctly seen a longer and more sickle-shaped claw, quite resembling that of the adult parasite; in the antennules and their setæ the corresponding structures are visible in a more developed form; and in the abdominal feet are very conspicuous distinctly segmented swimming-feet, in every detail agreeing with those of the adult; the long and elegant setæ with their delicate plumules are ensheathed in the shorter and bigger ones of the pupa (cfr. Fig. 24), and in the furcal setæ of the latter the longer ones of the next form show plumules. Any genital openings I have not been able to observe.

In casting off the pupal cuticle this enclosed Copepod probably gives up the fixed condition. As young males and females they leave the empty pupal shells on their former host, swim away and live for a while in a free state, in which they copulate. After copulation the males probably die, while the impregnated females again seek the same species of fish and take up the parasitic life anew, but in a more intense form: they pierce the skin of the fish and, gradually growing, penetrate through the muscles and reach by and by to the intestines of their host. The course of events here set forth, I am sorry to say, is not founded on direct observation; but any reader remembering the facts known from *Lernæa branchialis* will certainly find the above conjecture fairly plausible.

Fig. 4. Last pupal stage (E). Terminal part of setæ of foot, showing extremely delicate plumules.

Directly observed are some early stages of the boring parasite, the structure of which does not deviate very much from that of the Copepod, seen enclosed in the pupa E. As before mentioned they appear externally like small, pale cones of 0,5—2 mm. length, protruding through the skin of *Scop. glacialis*. I have dissected out 3 specimens. The one has a total length of 6 mm.; it projected as a 2 mm. long, slender thread from the back, just in front of the dorsal fin, of a fish of 57 mm. length; it was only inserted

into the muscles and did not reach the vertebral column; the mouth and feet were turned towards the surface of the fish. The other, figured on Pl. II, Figs. 16—18, had an external part of only 1 mm., peeping out of a pit in front of the dorsal fin of a *Scop. glac.* of 25 mm. length. It has pierced the whole musculature and reached between two ribs through the peritoneum, on the inside of which the mouth could be seen; the feet looked towards the vertebral column. The total length is 4 mm.; the cephalothorax is about 1 mm (0,96 mm.), the 3-segmented abdomen 0,240, the remaining ca. 3 mm. are almost entirely made up by the genital segment; the latter is densely striated transversely, and by a very feeble furrow indistinctly marked off from the end segment, carrying the small furcal appendages devoid of setæ. The genital openings are recognizable at the posterior boundary of the genital segment. Except the elongation of the genital segment and the reduction of the rostrum the shape of the animal is that of the stage inside the oldest pupa E. The details of the strengthening ridges of the cephalothorax and antennæ are the same through all stages, also those on the sipho; but the mandibular palp of the larva and pupæ appears now to have vanished.

The third specimen shows a step further towards the final shape (cfr. Pl. II, Figs. 19—21). It projected in front of the dorsal fin of a fish of 25 mm. length; the internal part perforated the muscles, passed close to the vertebral column between two ribs into the abdominal cavity, the mouth lying close to the left side of the small intestine at the origin of the hindmost pyloric appendage. The total length is 6 mm.; the cephalothorax 0,96 mm., the abdomen 0,277 mm., the rest ca. 5 mm. The genital segment is still more elongated, and more swollen posteriorly than in the former, the greatest diameter being 0,320 mm. while that of the cephalothorax is 0,40. Between the genital openings is seen a chitinous spot, probably where the copulatory openings are obliterated. The most marked difference from the two preceding specimens is that the lateral processes of the cephalothorax have appeared in the shape

of thinwalled, wing-like outgrowths ventrally to the margins of the shield; they reach from the level of the maxillipeds to the posterior end of the cephalothorax.

II. The Hydroid.

Seven specimens of the Hydroid have been found; 3 of these consist only of polypes, 4 carry besides sexual individuals. The polypes are all of one kind, functioning at the same time as hydranths and as blastotyles. They originate from a network of anastomosing tubes united by a thin membrane. The membrane and hydrorhizæ are without perisarc as well as the polypes. According to the size of the colony the membrane coats a greater or lesser part of the external portion of the *Sarcotretes scopeli*, described above. As the latter always turns the ventral face, on which the Hydroid is attached, towards the fish, a shelter is provided for the Hydroid. Larger colonies cover the whole ventral face of the parasite and embrace more or less also of its sides, but leave most of the dorsal face free; only round the base of the stalk the membrane may close as a ring. Generally only adult, egg-bearing parasites carry the Hydroid; but in a single case a *Sarcotretes*, which had evidently not yet formed egg-strings, was found provided with a Hydroid-colony (Pl. I, Fig. 6). The youngest Hydroid found had only a single, and still undeveloped polype, in which no mouth was perceptible (Pl. I, Fig. 4); another young colony contains 1 large and 4 smaller polypes (Pl. I, Fig. 5); a third has several polypes and coats most of the ventral face of its Copepod. In two colonies a single or a few polypes bear medusæ-buds; and in the remaining two most of the fully developed polypes carry at their base a number of buds in various stages of development, some of them quite medusiform, showing two tentacles. Most richly provided appears the specimen figured Pl. I, Figs. 1—3; the medusæ are here so numerous and prominent that they are the first to attract attention and determine the aspect of the whole colony.

The polypes are completely devoid of tentacles; their mouth is often expanded into trumpet-shape. When the mouth is expanded the oral entoderm is everted to form the disc or trumpet. Immediately below the disc is seen a narrow, feebly thickened ring, consisting of cylindrical ectoderm-cells somewhat higher than those of the rest of the body. Inside this ring the entodermal circular muscle-fibres are more strongly developed than in the remaining part of the body, these fibres evidently acting as a sphincter. When the mouth is closed, the ring-cells bound the mouth-pore.

Fig. 5. *Ichthyocodium sarcotretis.* Polype carrying medusæ-buds. *p*: polype: *m*: manubrium of medusa-bud; *r*: marginal tentacle, the greater part of which is bent up inside the bell and indicated as seen through the latter.

The body is cylindrical or claviform, sometimes goblet-shaped; the total length ca. 1—1,5 mm., the diameter from 0,048 to 0,176 mm. In the outer ectoderm of the membrane are numerous fairly large nematocysts, but I have not been able to detect any nematocysts whatever in the ectoderm of the polypes. In the most developed colony (Pl. I. Fig. 1) the largest polypes are found on the ventral side of the parasitic copepod turned towards the fish (therefore not shown in the figure). A proportionally great number of these large polypes (1,5 mm. or somewhat more in length) do not carry any medusæ-buds; but as a few of them bear a single large bud, some others a few small buds at their base, no definite demarcation between sterile and fertile polypes can be drawn, as already stated. Towards the margins of the colony almost all polypes are fertile. The distal part of those polypes which carry a great number of medusæ-buds — up to ca. 20 — is generally very slender and easily overlooked while more or less concealed among their buds (cfr. textfigure 5); but polypes with only a few or only small buds may have quite the same shape as those without any buds at all.

The medusæ-buds are found in all stages and sizes; the largest ones show clearly that they will be set free as real medusæ. Already tiny buds, of 0,160 mm. in diameter, have distinct rudiments of two marginal tentacles; in larger buds these have quite a considerable size but are still clumsy; nevertheless the tentacles are easily overlooked in many of the largest buds, because they have been bent up and concealed inside the umbrella. In the latter case the medusæ-buds appear elongated, fusiform (Pl. I, Fig. 2 *me*) and at first sight do not resemble medusæ at all; in clearing with glycerine or xylol etc. the marginal tentacles and the other medusoid structures are easily observed. There is a short manubrium; no mouth is yet formed, neither are there any indications of mouth-tentacles. In transverse sections the cavity of the manubrium is quadrangular; a narrow canal connects it with the gastric cavity of the mother-polype. The umbrella contains four distinct, wide and simple radial canals, connected distally by a ring-vessel; a velum is indicated as an outgrowth from the ectoderm of the subumbrella.

Fig. 6. *Ichthyocodium sarcotretis.* Medusa bud. *m*: manubrium; *r*: marginal tentacle.

The exumbrellar ectoderm contains numerous large nematocysts (ca. 0,004 mm. in diameter), most of them arranged as a broad band across the bell; this band may be distinctly seen already in quite young buds. The tentacles originate opposite the distal ends of two radial canals; they are hollow, their cavity connected with the ring- and radial vessel; no pigmented eye-spot is seen at their base. Between the tentacles the margin of the bell shows a small projecting fold at the ends of the other two radial canals, possibly indications of a new pair of tentacles, developing after the liberation of the medusa. Even in the most developed stage observed the tentacles appear clumsy, finger-shaped, somewhat shorter than the bell (Fig. 3). Sometimes they are bent in the way shown in textfigure 6; in this case they may be mistaken as going to branch into a group of two.

The largest medusæ-buds are fusiform or cylindrical, attached to the mother-polype by a pointed top. One of the largest measures from the point to the margin of the bell 0,40 mm., to the bent angle of the tentacle 0,490 mm., the greatest diameter of the bell being 0,192 mm.; another measures from its top to the distal end of the tentacle 0,62 mm. with a diameter of the bell of 0,232 mm. Genital cells I have not been able to observe; probably they will be found in the manubrium of later stages.

The facts mentioned clearly show that our Hydroid has to be classified with the Gymnoblastic Anthomedusæ. As it does not in every point agree with any other form known to me I propose to name it: *Ichthyocodium sarcotretis*. n. g., n. sp.

Besides *Protohydra*, *Microhydra* and the hydroid stage of *Limnocodium* a few Hydroids are known, the hydranths of which are completely devoid of tentacles. Among undoubtedly gymnoblastic Anthomedusæ I have only found four mentioned; they are all epizoic like our new form, a fact which seems to me of some interest. *Ichthyocodium* shows most likeness to *Hydrichthys mirus* Fewkes. This form was found in 1887 at Newport by Fewkes (7 *a* and *b*), growing on the skin of the fish *Seriola zonata* Cuv. The colony is attached by a thin flat membrane, containing a meshwork of tubes, to the skin of the fish in the neighbourhood of the anus. The membrane is said to be leathery, but without perisarc. From the tubes grow polypes of two kinds: 1) naked gonosomes, like clusters of grapes, consisting of an axial stem the terminal end of which is provided with a mouth-opening, and numerous branches; the latter are of the same structure as the stem, but closed terminally, where they carry clusters of medusæ-buds in various stages, up to medusiform bodies with two clumsy tentacles. The terminal part of the stem does not carry medusæ-buds, is devoid of tentacles, and its margin is entire. 2) Filiform polypes, supposed to be hydranths; they are described as flask-shaped bodies, resembling the palps of *Siphonophores* or the spiral zooids of *Hydractinia* (they are said to move in a similar way to the latter);

they, too, are devoid of tentacles and (probably) possess a mouth-opening, the terminal end sometimes appearing trumpet-shaped. 3) The medusæ. The largest buds are elongated, cylindrical; in the fixed state they do not develop more than two, clumsy tentacles; their surface is speckled with nematocysts (most distinctly seen in the younger stages, still before the medusoid shape is recognizable). When liberated — the fish was kept in an aquarium, and great numbers of medusæ were set free — they at first resemble a young *Stomatoca* (the medusa of *Perigonimus*), having an ovoid, upwards rounded bell, four simple radial canals and ring-vessel, and a proboscis with entire mouth. Later the medusa acquired four tentacles, two new growing out in the interspace of the two first formed. When all four are fully developed it resembles a *Sarsia*. In this stage, possessed of four long and slender tentacles, the medusæ sank to the bottom and died.

If we suppose that the medusæ of *Ichthyocodium*, when set free, also acquire four tentacles — which seems to me at least probable — they would agree with those of *Hydrichthys*; in the attached state, as buds, the likeness is practically complete. The differences of some amount between *Hydrichthys* and *Ichthyocodium* are the following: 1) the basal membrane in the first is firm, leathery; 2) the polypes are of two kinds, sterile and fertile ones; 3) the medusæ-buds are clustered on the ends of branches or stalks from the fertile polypes. According to the figures given by Fewkes (the author does not give any measurements of the polypes, buds or medusæ), the size of the colony in *Hydrichthys* surpasses that of the largest *Ichthyocodium* found; but it is by no means impossible that the latter may acquire a larger size and fuller development than the specimen figured Pl. I, fig. 1.

In 1907 R. E. Lloyd described a *Nudiclava monocanthi* growing on the fish *Monocanthus tomentosus* from the Andamana-Sea (13). Like the preceding this Hydroid is attached by means of a naked basal membrane, containing tubes from which naked, claviform hydranths without tentacles grow (0,75 mm. in length);

on their base they carry gonophores (generally each a single one). Only so far is there a likeness to *Ichthyocodium*; for the gonophores are not set free as medusæ but remain attached as sporosacs, resembling those of *Clava*, and in the same colony are found male as well as female individuals.

In 1909 Miss Winifred E. Coward (6) described *Ptilocodium repens*, epizoic on the Pennatulid *Ptilosarcus sinuosus* (Gray) (captured by the Siboga-Expedition at 9° 03′ Lat. S., 126° 24,5′ Long. E. in 112 Met. depth); it grows along the free edges of the leaves. The colony is dimorphic having two quite distinct forms of polypes arising from tubes enclosed in a basal membrane devoid of perisarc. The hydranths or "gasterozooids" are without tentacles, naked, and possess a simple mouth-pore; they show no nematocysts and reach at most a length of 0,373 mm. More numerous are the "dactylozooids" (ca. 0,186 mm. in length), short and broad polypes bearing at the terminal end four capitate tentacles crowded with large nematocysts; mouth and internal cavity are lacking, the entoderm of the tentacles and body being solid and scalariform. The gonophores arise from the base of the hydranths; they are described as sporosacs but provided with traces of four radial canals and of four rudimentary tentacles on the closed and rudimentary bell, the superficial ectoderm of which shows nematocysts; the closed manubrium bears (female) genital cells. According to the description it seems to me at least possible that these gonophores are not real sporosacs but may carry their development further and eventually be set free as medusæ. But even if this should not be the case, I think *Ptilocodium* has no close relationship to *Ichthyocodium*, the latter showing no dimorphism of the polypes; but *Ptilocodium* apparently is closely allied to the Hydroid, which Kükenthal found growing on another Octactinia. In 1909 Kükenthal described a new Gorgonid from Japan, *Anthoplexaura dimorpha* (11), on which he discovered this epizoic Hydroid (l. c. p. 24); he mentions polypes devoid of tentacles, and others provided with tentacles (sections through one of the latter are figured l. c. Pl. VII, Fig. 37),

and medusoid gonophores (Fig. 38). Later Stechow has examined in detail the same Hydroid (20 a, p. 31, Pl. III, Figs. 7—9); he has given it the name *Hydrichthella epigorgia* and referred it to the family *Corynidæ*. It is quite naked, without perisarc, with an incrusting or cushion-shaped basal coenosarc; stolons are difficult to see; the polypes are of three kinds: hydranths, devoid of tentacles ("Fresspolypen", 0,8—1,3 mm. in length), and two forms of "Wehrpolypen", both without mouth: the one (0,5—0,8 mm. in length) broader, with 4—8 short capitate tentacles in a simple whorl at the upper end; the other (0,53—1 mm. in length) more slender and resembling a long capitate tentacle. The sexual individuals are described as "sporosacs", attached singly by a short stalk to the hydranths; the ova (male specimens have not been found) are enclosed in the wall of a distinct spadix, and the envelope is provided with four distinct radial canals. Apart from the existence of 2 forms of "dactylozooids" the likeness to *Ptilocodium* appears so evident, that a close relationship can not be doubted. All specimens of *Anthoplexaura* from different localities and depths were richly beset with this Hydroid. Stechow, as already mentioned, has referred it to the family *Corynidæ*; and (20 b, No. 142, p. 152) he has also pointed out the close relationship to *Ptilocodium* and argues against the establishing of a new family for the latter. Also *Hydrichthys* is referred by Stechow to the *Corynidæ*; in so far as this will prove to be well founded, our *Ichthyocodium* has to be included in the same family. Thus this family contains the three of the above-mentioned four epizoic Hydroids devoid of tentacles.

It is mentioned above (p. 2) that the triple association of the Hydroid *Ichthyocodium* with the Copepod *Sarcotretes* parasitic on *Scopelus glacialis* is hardly quite an accidental one. I feel most inclined to consider it to be a new case of such regular associations — in some way or other fixed by law — which are known to occur among other Hydroids. That Hydroids in many cases may be found

growing on living animals merely accidentally is well known. I may refer to Alcock (2, p. 207) who has collected a series of examples. From my own experience I might add a case, at first sight parallel to that of *Ichthyocodium*, namely that of *Obelia geniculata*, which I have seen flourishing on a *Lernæa branchialis* attached in the gills of the common cod; a similar case is mentioned by Sæmundsson (21, p. 29). This Hydroid as well as those mentioned by Alcock normally grow on quite other substrata; by accident they may attach themselves to living animals, and they may occur on very different organisms. If, however, a Hydroid is quite regularly met with on the same animal — or a nearly related one — and is only found there, we may be sure that we have before us some kind of symbiosis, in most cases probably a form of commensalism. To decide whether the association involves a reciprocal advantage or is beneficial only to the one part is in most cases very difficult, and a matter of mere conjecture. Alcock also mentions a number of such regular combinations (l. c. p. 208), and he adds as a new case that of *Stylactis (Podocoryne) minoi*, which he always found attached to the skin of the fish *Minous inermis*, while other species of *Minous* apparently were free of this Hydroid. Later the same has been observed at Japan (Franz and Stechow (8), Stechow 20 a; Pl. IV, Fig. 8). That after Heath (9) *Minous inermis* also may be found free of this Hydroid (Snyder is said by H. to have captured several specimens uninfested) in my opinion does not alter in any way the character of *Stylactis minoi* as a symbiotic form; hitherto it has never been found on other substrata than the body of a *Minous*. A somewhat similar association is described by Heath (l. c.): of 37 specimens of the cottoid fish *Hypsagonus quadricornis*, captured in Puget Sound (Friday Harbor), 10 were coated with *Perigonimus pugetensis*, a new species related to *P. vestitus* Allm.

As a "triple-association" between a Hydroid and a Crustacean parasitic on a fish, which perhaps is a regular one, I might mention that of *Eucope parasitica*. This Hydroid is described by Al.

Agassiz (1, p. 87) as found (more than once) on a species of *Pennella* parasitic on *Orthagoriscus mola*; later the same Hydroid was taken by Leidy (12, p. 165) on another Lernean *Lernæonema procera* parasitic on *Odontaspis littoralis* [1]). Hitherto this Hydroid has only been observed growing on Lerneans on fishes; but it is very close to *Eucope polygena*, attached to quite other substrata, and it seems questionable if this case is really different from that of *Obelia geniculata*, mentioned above. At all events the special interest which we at first sight might attach to the examples quoted of associations between Hydroids and Fishes, and still more to those between Hydroids and Lerneans parasitic on Fishes, looses very much when we consider the structure of the Hydroids in question. None of these Hydroids, neither *Stylactis minoi*, nor *Perigonimus pugetensis*, nor *Eucope parasitica* show any peculiar adaptation for their occurring on a living animal, not in the least any more than *Obelia geniculata*, usually found on quite other substrata; in no respect do they carry the stamp of being transformed owing to their peculiar habitation. Whatever the advantage may be for the one part of the association, the Fish or the Lernean, for the Hydroid it will possibly be that of getting an easier access to food supply; but the kind of food and the mode of grasping it I think must be the same as that of their nearest allies not found on living animals.

With *Ichthyocodium*, *Hydrichthys* and *Nudiclava* the case seems to be different. In these Hydroids all the polypes have lost their tentacles; probably because they get their food in another way and take another kind of food than their nearest relatives [2]). I think they depend in some way or other on the fish for food (the Parasitic Copepod in the case of *Ichthyocodium* only serving as attach-

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[1]) Whether the "*Campanularia*" which Paul Mayer (15, p. 53) found growing in great numbers on the filaments of a *Pennella (filosa?)* parasitic on *Xiphias gladius* is identical with *Eucope parasitica* Ag. I am unable to decide.

[2]) The absence of nematocysts in the polypes of *Ichthyocodium* seems to point in the same direction.

ment); but how, I am not able to decide. That they as true parasites should feed directly on the tissues of the fish is possible, but seems less probable; neither in *Hydrichthys* nor in *Nudiclava* are the hydrorhizæ sunk into the skin, and the latter appears not to be affected by their presence (the same holds good for the *Scopeli* carrying *Ichthyocodium*); more likely they are messmates or commensals, feeding on leavings from the meals of the fish or perhaps on the excrement of the latter. I may add that I found no contents at all in the gastric cavity of the polypes of *Ichthyocodium* which I have cut in sections.

Explanation of the plates.

List of reference letters.

a = anus.
a_1 = antennule.
a_2 = antenna.
f = furcal appendage.
g = genital segment.
l = chitinous thickening.
m = manubrium of medusa-bud.
md = mandibular palp.
me = medusa-bud.
mp_1 = maxilliped of first pair.
mp_2 = maxilliped of second pair.
mx = maxilla.
o = genital opening.
p = polype.
p_1—p_3 = first to third abdominal (thoracic) foot.
pr = lateral outgrowth from cephalothorax.
r = marginal tentacle of medusa-bud.
si = sipho.

Plate I.

Fig. 1: *Scopelus glacialis* Rhdt. with the combined parasite, composed of the *Sarcotretes scopeli* (without egg-strings) and the *Ichthyocodium sarcotretis*. × c. 2.

— 2: enlarged view of part of the same specimen of *Sarcotretes* (the stalk and proximal part of the swollen external portion) with part of the Hydroid-colony. me_1 = large medusa-bud having lost one of its marginal tentacles.

Fig. 3: one of the largest medusa-buds. Zeiss Comp. Oc. 4, Apochr. 8.
— 4: base of external part of a *Sarcotretes* carrying a young *Ichthyocodium*, consisting of a single polype, still without mouth-opening ("Thor"'s station 124).
— 5: the same part of another *Sarcotretes* with a young Hydroid-colony of polypes of different sizes ("Thor"'s st. 93).
— 6: posterior portion with the stalk and part of the internal portion of a *Sarcotretes* showing a Hydroid-colony with several polypes (only one carrying a tiny medusa-bud, *me*) and its ramified tubes of the basal membrane ("Thor"'s st. 89). Zeiss Oc. 1, Obj. a* 10.
— 7: adult female *Sarcotretes* with egg-strings ("Thor"'s st. 76). Zeiss Oc. 1, Obj. a* 10.
— 8: anterior part of the same, from dorsal side, but somewhat obliquely ("Thor"'s st. 76). Z. Comp. Oc. 4, Apochr. 16.
— 9: posterior end of the same, ventral aspect. * chitinized spot, probably where the copulatory openings have been. × as Fig. 8.
— 10: anterior part of an adult *Sarcotretes* ♀, ventral aspect („Thor"'s st. 89). Enlargement as in Figs. 8 and 9.

Plate II.

Fig. 11: Cyclops-stage (A) of *Sarcotretes scopeli* from left side ("Thor"'s st. 80). Z. Comp. Oc. 4, Apochr. 8.
— 12; the same, dorsal view.
— 13: second pupal stage (C), from right side. ("Thor"'s st. 177). Z. Comp. Oc. 4, Apochr. 16.
— 14: third pupal stage (D), male specimen ("Thor"'s st. 80). Magnif. as Fig. 13.
— 15: fourth pupal stage (E) ("Thor"'s st. 76). Inside the sipho is seen part of the mouth-funnel of the enclosed copulatory stage.
— 16: young female, ca. 4 mm. long; stage inserted into the body wall of the fish ("Thor"'s st. 76). Z. Oc. 1, Obj. a* 10.
— 17: anterior part of the same specimen, from dorsal side. Z. Comp. Oc. 4, Apochr. 16.
— 18: posterior end of the body of the same, lateral view. Enlarg. as the preceding.
— 19: young female, somewhat older than the preceding, from right side ("Thor"'s st. 76). Oc. 4, Obj. a* 10.
— 20: anterior part of the same. Z. Comp. Oc. 4, Apochr. 16.
— 21: same part, ventral aspect.
— 22: posterior part of first pupal stage (B), from below (stat. 80). Z. Comp. Oc. 4, Apochr. 8.
— 23: first pair of abdominal (thoracic) feet of third pupal stage (D); same specimen as Fig 14. Z. Comp. Oc. 4, Apochr. 8.
— 24: posterior part of fourth pupal stage (E), ventral aspect (st. 76), same specimen as fig. 15. Inside the left foot of the first pair (p_1) are indicated the outlines of the same foot of the enclosed copulatory stage. Z. Comp. Oc. 4, Apochr. 8.

Fig. 25: right foot of second pair of the same specimen, from below. Enlarged as Figs. 23—24.

— 26: right foot of third pair of the same specimen, from below. As Figs. 23—25.

— 27: *Peroderma bellottii* Rich., ♀ (without egg-strings), inserted into the arterial bulb *b* of the heart of *Scopelus glacialis*; *v* = ventricle; *a* = auricle; *ar* = stem of branchial artery. ("Thor" 's st. 99, 1910). Z. Oc. 1, Obj. a* 10.

The figures 1, 2, 4 and 5 are drawn by H. V. Westergaard, the remaining by the author.

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18—12—1911.

Om fritbyggede Honningbirereder i Danmark.

(On the nidification of honey-bees in the open-air in Denmark.)

af

Dr. phil. ***J. C. Nielsen.***

Honningbireder, der i Lighed med de to tropiske *Apis*-Arter *Apis florea*'s og *A. dorsata*'s Reder er byggede frit, d. v. s. hverken i Kuber eller i hule Træer, men befæstede til Trægrene og saaledes at Vokskagerne er ubeskyttede, forekommer meget sjældent. Fra ældre Tid kendes kun en af Curtis [1]) omtalt og afbildet Rede, som var fundet i England i Aaret 1838; i de senere Aar har Professor E. L. Bouvier [2]) i forskellige Afhandlinger beskrevet fire saadanne Reder, to, der var byggede paa Træer i eller i Omegnen af Jardin des Plantes i Paris, en fra Midtfrankrig og en fra Korsika.

Alle Rederne bestod af flere, 6—8, Vokskager, der var befæstede til Grene og var mere eller mindre regelmæssigt byggede alt efter Underlagets Beskaffenhed.

Ogsaa i Danmark er der i de sidste Aar fundet fritbyggede Honningbireder.

En saadan opdagedes i Oktober 1908 i en Have ved Strandvejen omtrent en halv Mil nord for København og blev af Havens

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[1]) Curtis: British Entomology IV, 1823—1840, p. 391, Tab. 769.

[2]) E. L. Bouvier: Sur la nidification d'une colonie d'Abeilles à l'air libre (Bulletin de la Société Philomatique de Paris 1905. p. 187). — Nouvelles Observations sur la nidification d'abeilles à l'air libre (Annales de la Société Entomologique de France Vol. LXXV, 1906, p. 429). — Note sur les nids aeriens de l'abeille mellifique (nouveaux faits) (Bulletin de la Société Entomologique de France 1907, p. 294).

Ejer, Grosserer A. S. Goldschmidt, skænket til den kgl. Veterinær- og Landbohøjskoles zoologiske Samling, hvor den nu opbevares.

Reden (Fig. 1, 2), der bestod af fire nogenlunde parallelt byggede Vokskager, var anbragt paa et Hestekastanietræ i temmelig betydelig Højde over Jorden; over den dannede Træets Blade et tæt Dække, og dens mod Nord vendte Side var dækket ved Træets Stamme og Blade, medens dens sydlige Side var mere udsat. Reden var fæstet til Undersiden af en Gren af Diameter c. 4 cm, hvis indre (mod Stammen vendte) Del i Modsætning til den ydre, forgrenede Del kun frembød forholdsvis sparsom Plads til Anbringelse af Vokskagerne. Henimod Grenens Basis, hvor Kagerne var byggede tæt op imod hverandre, indeholdt de Celler med ganske lave Vægge; længere ude derimod, hvor de ogsaa var befæstede til Sidegrenene og hvor Kagerne delvis var sammenbyggede (Fig. 2) var Cellerne endog meget højere end normalt. De fire Vokskager var omtrent af samme Størrelse, nogle og tredive Centimeter brede og nogle og tyve høje. I de to yderste og i en af de inderste havde Bierne boret flere Smaahuller, hvis Diameter var indtil 3 cm. Vokskagerne indeholdt hverken Dronninge- eller Droneceller; nogle ganske faa Celler ved Basis af en af de midterste Vokskager indeholdt Honning; alle de andre var tomme.

Den anden Rede (Fig. 3, 4) fandtes i Begyndelsen af Juli 1911 i Frederiksberg Gymnasiums Skolehave og blev af Skolebestyrer L. Otterstrøm givet til Universitetets zoologiske Museum. Den var anbragt i en Højde af c. 2 Meter over Jorden paa den sydlige Side af et Pæretræ og befæstet til en omkring dettes Stamme voksende Kaprifolium. Den var, da den fandtes, saa stor som en Haand og voksede i Løbet af Sommeren til en Størrelse af c. 38 cm i Højden og c. 26 cm i Bredden; i September, da den fotograferedes, bestod den af 6 Vokskager foruden en lille halvrund Kage, der var bygget over de øvrige Kager, vinkelret paa disse.

Reden hvilede fornemmelig paa et Par tykkere, sammensnoede Grene af Kaprifolien, men støttedes desuden af flere andre Grene, hvoraf nogle helt omsluttedes af Vokskagerne; den nedre Bagrand

af disse var dybt indbugtet omkring nogle større Grene. Vokskagerne var, bortset fra den nysnævnte lille halvrunde Vokskage, parallelt stillede. Af Fig. 3, der viser Reden skraat fra venstre, fremgaar, at de to yderste Kager var sammenbyggede lidt nedenfor Midten; paa samme Maade var den næstyderste Vokskage sammenbygget med den tredie o. s. v. Reden udgjorde som Følge heraf et sluttet og solidt Hele.

Ligesom i den først omtalte Rede fandtes der i denne kun smaa Celler; ganske faa af disse indeholdt Honning.

Som Billederne viser, sad Bierne i Mellemrummene imellem Vokskagerne. Efterhaanden mindskedes deres Antal; i Slutningen af Oktober fandtes der kun Bier i to af Mellemrummene. Den 24. November blev Reden taget ind; den foregaaende Nat havde det frosset, og en Del af Bierne var faldne til Jorden. I de to Mellemrum sad endnu omtrent 150 tilsyneladende livløse Bier, adskillige med Forkroppen stukket ind i de tomme Celler, en Stilling, som ogsaa de to fornævnte Forfattere har set, at Bierne indtog i de af dem undersøgte Reder. Efter at Reden i nogen Tid havde været anbragt i en opvarmet Stue, viste det sig, at de fleste af Bierne dog ikke var døde.

De to beskrevne Reder er ikke de eneste her i Landet fundne Exemplarer af fritbyggede Honningbirеder. Docent R. H. Stamm har meddelt mig, at han har været i Besiddelse af en Vokskage, der var funden bygget til Undersiden af en Bøgegren og fæstet til Bladene. Noget nærmere om denne Rede, dens Bygning og Findested kan desværre ikke nu oplyses.

Summary.

This paper deals with the specimens of honey-bee-nests constructed in the open air hitherto found in Denmark.

Figs. 1—2 show a nest, found in a garden ca. 2 miles north of Copenhagen, attached to the underside of a branch of a horse-

chesnut. The nest was composed by 4 honey-combs, whose dimensions were nearly the same, a little more than 30 cm. in breadth and between 20 and 30 cm. in height.

In Figs. 3—4 a nest, found in a garden at Frederiksberg (Copenhagen) is represented; the nest was attached to the branches of a honey-suckle, growing on a pear-tree, and consisted of 5 honey-combs, which were mutually connected. The length of the nest was ca. 38 cm and the breadth ca. 23 cm.

In both nests were found neither drone- nor queen-cells and in both only few cells contained honey.

6—1—1912.

Fig. 1.

Fr. Riise phot.

Fig. 2. Fr. Riise phot.

Fig. 3. R. S. Stamm phot.

Fig. 4. R. H. Stamm phot.

Contributions to the biology of some North Atlantic species of Eels.

By

Dr. ***Johs. Schmidt.***

(With Plate III.)

In an article in "Nature", 2158, 1911, I showed how the common European Conger-eel (*C. vulgaris*) reproduces both in the western and eastern part of the Mediterranean, mainly at or over great depths, the early fry being found in quantities in the surface-water far from the shores. As the Atlantic material collected by the "Thor" and by numerous other Danish vessels in earlier and more recent years has now been worked up, some further information can be given regarding the biology of this fish. From the same parts of the Atlantic we have three other Leptocephali, namely, *Conger* (*Congromuræna*) *mystax*, *C.* (*Congromuræna*) *balearicus* and *Leptocephalus lanceolatus*, and these may also be mentioned here. The common Conger, as is well known, is a fish of great economic importance, the second and third are of no value as food-fishes, whilst the adult of the fourth is as yet unknown; nevertheless, they are all of no little biological interest, and the same is the case with two other forms, *Leptocephalus ingolfianus* and *L. Andreae*, which may be just mentioned here.

The older full-grown larval stages and the transitional stages of the first three species have long been known, though from a few isolated localities only. After Gill, Delage and Grassi and Calandruccio had shown that Leptocephali were the larvae of

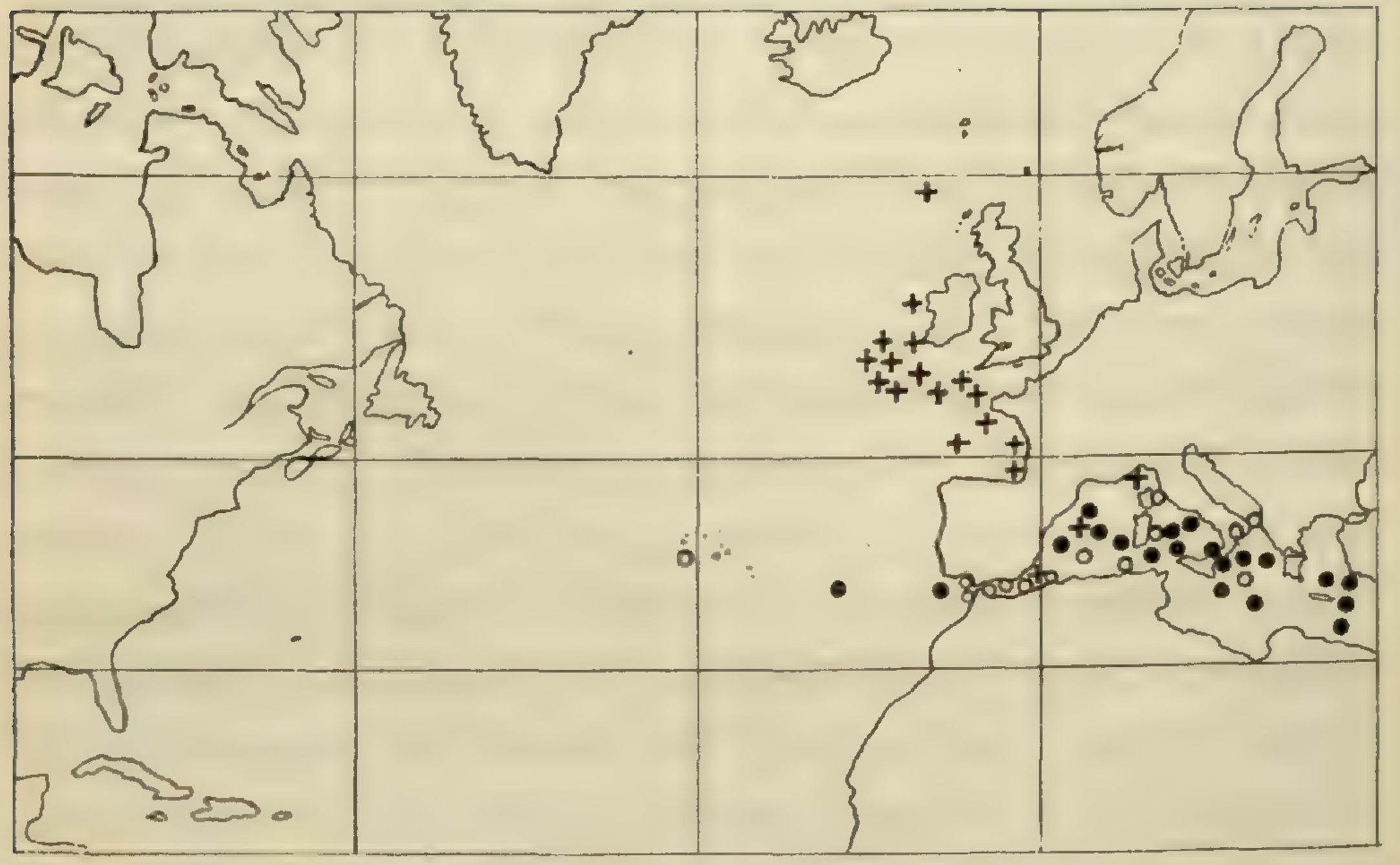
eels, their study became of much greater interest, but it must be confessed, that the older descriptions of the Leptocephali are so imperfect and unsatisfactory, that a certain determination of the species from them is impossible; naturally, any attempt to discuss the distribution of the species on such a basis is still more impossible. It may be said that in addition to a good figure, the main thing required in a careful description is the exact number of myomeres. Grassi and Calandruccio pointed out that the number of myomeres in the Leptocephali corresponds to the number of vertebræ in the parent form. This fact I have frequently confirmed and we thus have a means of referring a Leptocephalus to its parent species as well as of distinguishing between the different Leptocephali, even when in other characters there is apparently no difference.

Though Delage showed that *L. morrisii* is the larva of *Conger vulgaris* and Grassi and Calandruccio, on confirming this, added that several Leptocephali known from the Straits of Messina under various names are the larvae of *C. mystax* and *C. balearicus*, yet, up to the present time, figures and descriptions of these three Leptocephali which would enable us to distinguish them from nearly related forms have not been published. I have found it necessary, therefore, to study the question anew from the very beginning in the only way possible, namely, by counting the vertebræ in the larval and adult forms. In this way I have been able to determine the larval stages occurring inside the territory investigated, which includes the Mediterranean and the North Atlantic north of ca. 20° N. L.

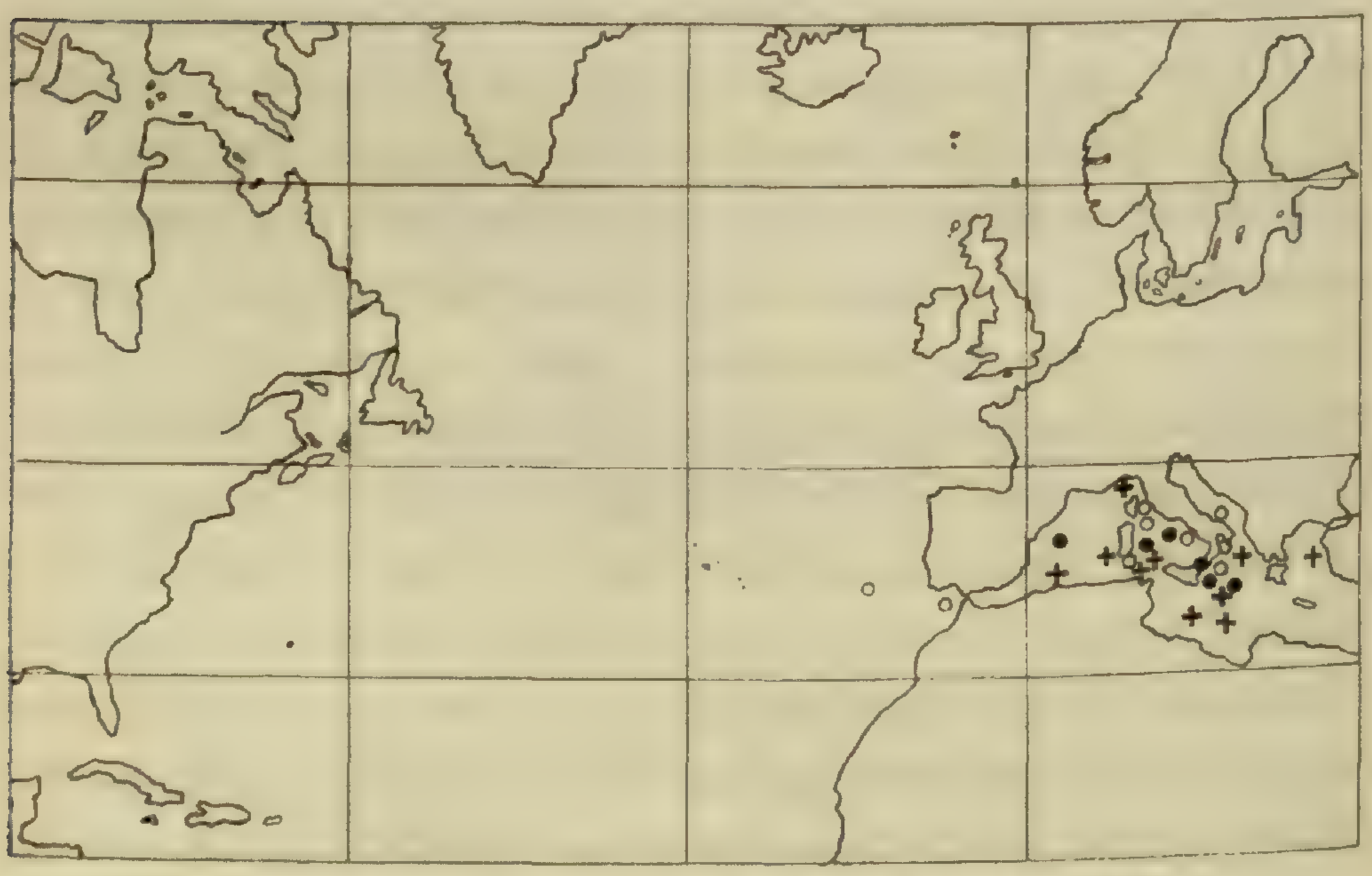
The full-grown larvae of the Conger-species mentioned differ in regard to size. *C. balearicus* has the largest larva (ca. 20 cm.), *C. mystax* the smallest (ca. 13 cm.), whilst the larva of *C. vulgaris* may attain a length of ca. 16 cm. All three species have long ribbon-like bodies with the anus far behind near the beginning of the tail, nearest in *C. balearicus*, furthest away in *C. vulgaris* (see figs. 1—6).

The pigmentation, whose diagnostic importance in the Leptocephali was sufficiently pointed out by the Italian Bellotti (1883), is very characteristic and makes it possible to distinguish the three species occurring in our territory at a glance. They all have pigment along the gut, at the end of the tail and between this and the anus along the base of the anal fin; but from the pigment on the sides alone the species may easily be distinguished. *Conger mystax* does not have this pigment, *C. vulgaris* has a row of rather large round spots and *C. balearicus* has short rows of fine points on the boundaries between the muscular segments. *C. balearicus* besides has large isolated patches on the dorsal margin which are lacking in the other species. The number of myomeres which corresponds to the number of vertebræ in the species in question is also different, in *C. vulgaris* ca. 158, in *C. mystax* ca. 138 and in *C. balearicus* ca. 130.

The ca. 1—2 cm. long larvae of *C. vulgaris* and *C. mystax* have been taken by the "Thor" in quantities in the Mediterranean, but it was only by means of long series of intermediate stages, up to a length when the number of vertebræ could be determined with certainty, that we have been able to identify them. In figs. 2 and 4. these stages of the two species are represented from specimens which were so well preserved that they could be microphotographed. It is easily seen from the figures. that the larva of *C. vulgaris* differs from *C. mystax* by having a shorter snout and a longer tail; further, the pigment patches along the gut are much closer together in the latter than in the former and *C. mystax* also has some pigment spots at the point of the lower jaw which are wanting in *C. vulgaris*. Of *C. balearicus* I have not seen stages smaller than ca. $2^1/_2$ cm. and these are already so characteristic, owing to the pigment on the sides, the dorsal pigment and the position of the anus, that they cannot be confused with other species. A fourth species of Leptocephalus, of unknown parentage, will be described later; meanwhile, I may just briefly discuss the distribution and biological conditions of the above three species, for which both the



Conger vulgaris: ● Early larvae (1—2 cm.).
○ Half-grown larvae.
+ Full-grown larvae.



C. (*Congromuræna*) *mystax:* ● Early larvae (1—2 cm.).
○ Half-grown larvae.
+ Full-grown larvae.

Leptocephalus and adult stages are known. The data are noted on the accompanying charts.

1. *Conger vulgaris.* My article in "Nature" dealt in the main with the Mediterranean and did not say anything positive as to the spawning-places of the Conger in the Atlantic except that they lie at great depths not far from the Straits of Gibraltar. A further revison of the material has thrown more light upon this question. In the years 1903—06 the "Thor" made extensive investigations in the North Atlantic between Iceland and Spain and found a considerable number of larvae of *Conger vulgaris*, but they were all quite or almost full-grown and consequently revealed nothing about the spawning-places of the species, their age and the time they had been floating in the sea being unknown.

It was therefore a great advance when we found larvae of only 9 mm. in length in the Mediterranean, enabling us to say that we were at or very close to the spawning-places. Furthermore, we ascertained that Conger larvae in the course of half a year grow ca. 5 cm, which gave us the first definite point of support for the determination of the age of any eel-larvae. By far the greater number of larvae below 2 cm. were found over depths greater than 2500 m., even greater than 3000 m., and, as already mentioned, near the surface. During the first days of July and the last days of August investigations were carried out between the Balearic Isles and Sardinia. The early larvae were found in quantities in August but not in the beginning of July, and during the investigations in December, January and February not a single larva smaller than 5 cm. was obtained in the whole Mediterranean. We may therefore draw the conclusion that *Conger vulgaris* spawns in summer and spring in the Mediterranean, somewhat earlier in the eastern than in the western basin.

Thus the early larvae of the common Conger appeared to be very easy to obtain; they are fairly slow in their movements and are found near the surface or right at the surface where they can be taken with any fine-meshed net slowly towed through the water.

The half-grown larvae of ca. 7 cm. in length also appeared to be easily caught. There can be no doubt therefore that the reason why we did not find the early and half-grown larvae during our extensive investigations in 1903—06 west of the British Islands and France and further to the north, must have been that they do not occur there or, in other words, that the Conger does not spawn in those parts of the Atlantic where the species otherwise is so common. Through the discovery of larvae 1 cm. long we have already obtained an indirect confirmation of this fact and, at the same time, the position of spawning-places of the European Conger in the Atlantic have been found. These larvae were taken during the latter half of July at the surface over depths greater than 3000 m. and even greater than 4000 m., i. e. under quite similar conditions as in the Mediterranean. The discovery of these larvae, the smallest of which, to judge from the growth of artificially hatched Murænoid larvae, may be about three weeks old at the most, enables us now for the first time to outline with certainty spawning-places of a definite eel-species in the Atlantic. According to the available data *C. vulgaris* spawns in the Atlantic between 30° and 40° N. Lat., between Europe and the Azores in places where the depth exceeds 3000 m. In our material there is no indication that it spawns nearer North Europe and the British Islands and we must therefore draw the conclusion that the Conger migrate south and westwards from these regions in order to spawn, in the same way as the fresh-water eel, a fact formerly pointed by me. It is probable that the Conger migrates in order to seek warm and very saline water. I am not able to say at what depth the eggs are spawned. But when the early larvae are found at the surface over depths of more than 4000 m., it seems much more probable that the Conger spawns pelagically than at the bottom.

The occurrence of Conger larvae in the Atlantic seems to agree very well with what we know from the Mediterranean, thus the 1—2 cm. long stages are found in the summer, the half-grown

in the winter, so that the life-cycle is as follows: the *Conger vulgaris* spawns in spring and summer in regions where the depths are very great and the water warm and salt (above 36,00 ‰). During winter the larvae reach half their full size and in the following spring and summer the metamorphosis takes place; thus, they live pelagically for 1 to 2 years. The very long duration of the pelagic life accounts for the fact that the larvae of the Conger, like those of the fresh-water eel, are able to spread over such wide regions.

Besides from the Atlantic and the Mediterranean I have seen larvae of the same type as those of the common Conger from the Inland Sea of Japan.

2. *C.* (*Congromuræna*) *mystax*. This species belongs to the Mediterranean, where however its larvae were formerly only known from the Messina Straits. Our investigations have shown that they occur everywhere in the Mediterranean, but outside this sea only a few specimens have been found in the Atlantic not far from Gibraltar. The occurrence of the larvae shows that it spawns later in the year than *Conger vulgaris*, i. e. later in summer and autumn, at which times of the year the smallest stages are found, and it is possible that this species spawns a little nearer the coasts than *Conger vulgaris*.

Strömman mentions a form from the South Atlantic (35° 40′ S., 18° 45′ E.), which seems to be very closely related to *C. mystax*.

3. *C.* (*Congromuræna*) *balearicus*. We have two fairly modern descriptions of eel-larvae, by Strömman (1896), and by Eigenmann and Kennedy (1902)[1]). But only the latter is of any use for a certain identification of the species. Strömman does not give the number of vertebræ, so that none of his species

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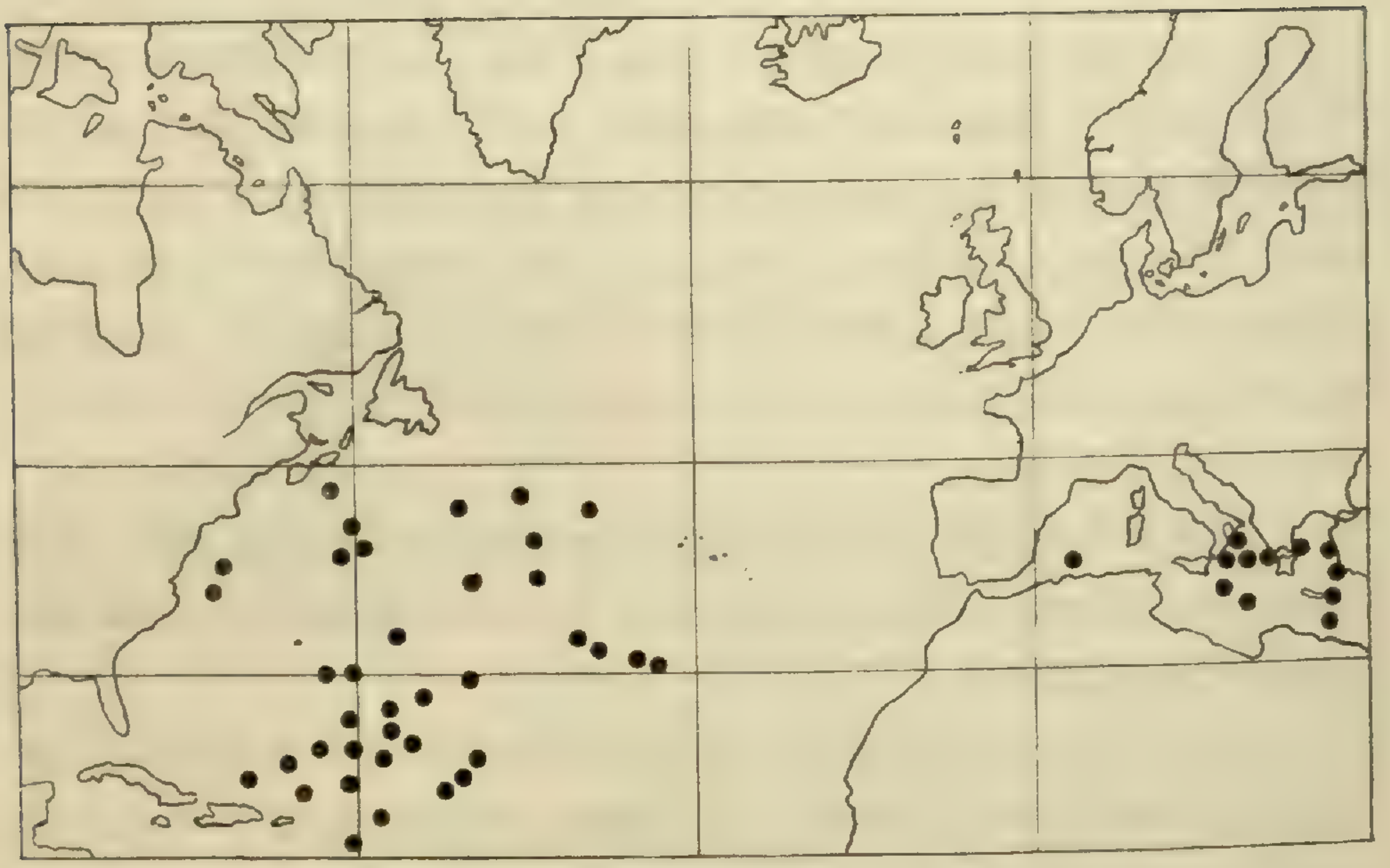
[1]) I have described a Leptocephalus from the Atlantic under the name of *L. latus* (Medd. Komm. Havunders., Ser. Fiskeri, Bind III, Nr. 6, 1909), but had overlooked the fact that this name was already occupied. I now propose the name *L. latissimus*.



C. (Congromuræna) balearicus: ● Larvae.

(The specimens from the Atlantic = *Leptocephalus Eckmani* Strömman emend.)

Leptocephalus lanceolatus Strömman emend.

● Early larvae (1—2 cm.).

○ Older larvae (2—6 cm.).

can be determined with certainty, but through the kindness of the authorities at the Zoological Museum of Upsala I have been able to examine his type specimens; in this way it has been possible to determine their characters and thus to avoid making new names. On counting the vertebræ I found that his *Leptocephalus Eckmani* is identical with a species occurring in immense quantities in our gatherings, especially in the Atlantic west of the Azores. In the Mediterranean a very similar form was described many years ago under the names of *Leptocephalus diaphanus* and *Leptocephalus inornatus*. To determine whether the two forms from the Atlantic and the Mediterranean had anything to do with each other, however, necessitated a comparison of numerous specimens, including counting of vertebræ. It then appeared that the two forms are very closely related, so closely that it is doubtful whether they can be always distinguished when the place of occurrence is unknown. The number o vertebræ is not absolutely different, as the same number may be found in specimens from the Atlantic and Mediterranean, but on an average the number of vertebræ in the form from the Atlantic is 2—3 more than in the form from the Mediterranean. Further, the head of the latter is a little stouter and the rows of pigment spots between the myomeres are a little more marked, containing a few more spots. The Atlantic form is, numerically, by far the most important of all eel-larvae in our collections, showing that it must have a very wide distribution. It has been taken off the continental slope of the western part of the Atlantic from Newfoundland to Guiana and eastwards it ranges to near the Azores. It occurs in largest quantities between 50° and 70° W. Long., taken at the surface over the greatest oceanic depths. H. M. S. "Ingolf" which has made collections for us, took no fewer than 477 specimens in

[1]) I imagine that the *Congromuræna flava*, Goode & Bean (Deep-Sea Fishes of the Atlantic Basin, p. 138, 1895) is the parent species of our Atlantic Leptocephalus specimens of *C. balearicus*, but the description of the two American naturalists is not sufficient to permit an identification.

a single haul of 1/2 an hour with a net of 1 1/2 m in diam., near 60° W. and 25° N. According to our present investigations it occurs between 15° and 43° N. and between 32° and ca. 75° W. but it has not yet been taken east of 30° W. Long. In the Mediterranean we find a very closely related but not quite identical form; of this the greatest number of larvae were taken in the eastern basin (east of Italy). On the other hand, we have larvae from the eastern part of the Gulf of Mexico, which differ from the central Atlantic larvae by a lower average number of vertebræ. Thus, in the North Atlantic region we have 3 forms of *C. balearicus*, whose larvae can be distinguished by a small average difference in the number of vertebræ. The larvae living in the Western and central parts of the West Atlantic have the highest number of vertebræ, whilst in the larvae from the European and American Mediterranean (Gulf of Mexico) the average is a little lower. Furthermore, we have specimens from the Southern Atlantic and the Indian Ocean in the older Danish collections, and in the collections of the "Albatross" from the Philippines I have seen quantities of related Leptocephali. *Conger balearicus*-like forms must therefore be very widespread in the warmer parts of the oceans.

As our material does not contain smaller larvae of this species than 2 1/2 cm., it is impossible to determine the position of its spawning-places in the Atlantic and even though the various sizes of the larvae at different places over the vast region of occurrence seem to indicate, that the spawning of the species is restricted to certain parts, I prefer to postpone discussion of this question until we have obtained more definite data.

Lastly, I may just briefly refer to a fourth species of Leptocephalus, which is represented in our collections by a large and valuable material. In old samples dating from Capt. Andréa's time, a Danish Captain who made pelagic collections for the Zoological Museum in Copenhagen between ca. 1860 and 1880, as also in collections made during recent years for "Kommissionen for Hav-

undersøgelser" by various Danish ships, there occurs a characteristic, small Leptocephalus which at first glance resembles *L. brevirostris*. The resemblance is however quite superficial and there can be no question of relation. Fig. 7 shows the external appearance; it will be seen that the tail is pointed and the snout much longer than in *L. brevirostris*. Furthermore, the myomeres have quite a different shape and there is pigment on the tail. An examination of Strömman's type specimens of Leptocephali has convinced me that it must be identical with his *L. lanceolatus*, though this cannot be recognized from his description. The present species has ca. 160 myomeres of which ca. 88 are preanal and my specimens vary in length from ca. 1 to ca. 6 cm. Strömman's largest specimen was 33 mm. and not full-grown. The distribution is seen from the chart (p. 44); it has been found west of 30° W. Long., like *C. balearicus*, but also in the deep, eastern part of the Atlantic near 30° N. L. A point of special interest is the discovery of larvae 1 cm. long in the central, deepest parts of the Atlantic. These show that the species must spawn out here, as larvae of 1 cm. in length cannot have drifted very far from the spawning-places [1]). Further, the discovery of such early larvae at the surface

[1]) The same is the case with a species of *Nettastoma* from the Atlantic and with a species for which I propose the name *Leptocephalus ingolfianus*. As may be seen from the figure 8 it resembles *C. mystax* in shape, but is somewhat higher, and is easily distinguished from this in lacking the pigment row along the gut. (In *L. ingolfianus* pigment is only present near and at the end of the tail.) The number of vertebræ is also different exceeding 150 in *L. ingolfianus*. (In one specimen 79 mm. long I found 118 + 35 = 153 and in a smaller 120 + 35 = 155.) The present specimens measure from ca. 1 to ca. 8 cm. in length and have been found in the Atlantic SW of the Azores, at the surface over a depth of more than 3000 m. (32° 03′ N., 39° 00′ W).

I am unable to say whether another species whose larvae occur in our collections (see fig. 9) and which is related to Strömman's *L. tiluroides*, also propagates in the deep parts of the Atlantic like the parents of *L. lanceolatus* and *ingolfianus*, as we have not obtained specimens less than ca. 7 cm. in length. Is has about 250 preanal vertebræ and is further characterised by the presence of ca. 4 large

over great depths of the ocean, seems to exclude the possibility that the species spawns on the bottom, 6000 m. below the surface where the larvae were found.

The four species mentioned with *Anguilla vulgaris*, *Anguilla rostrata* and *Synaphobranchus pinnatus* compose the greater part of our material from the North Atlantic region. Postponing meanwhile an account of the biology and distribution of the last 3 species I may sum up our results regarding the distribution of the other four. According to the foregoing *C. balearicus* belongs apparently to the western region (west of 30° W. Long.), though a form very closely related to it occurs in the Mediterranean. In regard to the others, *C. mystax* is apparently restricted to the Mediterranean and adjacent parts of the Atlantic and our investigations with the "Thor" show that it spawns in the Mediterranean in summer and autumn. *C. vulgaris* propagates both in the Mediterranean and in the eastern part of the Atlantic between 30° and 40° N. Lat. but not off the shores of the British Isles or France, nor further to the north or east; we may thus conclude that the Conger living here, like the fresh-water eel, migrate south- and westwards in order to spawn in warmer and salter water than they live in during their years of growth. All the information obtained from our present investigations show that *Conger vulgaris* has a rather restricted spawning-time in spring and summer.

L. lanceolatus occurs both in the western, central and eastern parts of the Atlantic between ca. 25° and ca. 35° N. L., where it is born in the central, deep parts of the ocean — a fact which also applies to *L. ingolfianus* and most likely to many other murænoid species.

On the other hand my investigations in the Mediterranean have shown that the dogma put forward by Grassi that all Murænoids spawn in deep water (at least 500 m.) cannot be maintained. As

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and distant pigment patches sublaterally in the front part of the body. For this form I propose the name *L. Andreæ* in honour of the late Danish captain who collected such a valuable material of Leptocephali.

far as the investigations go we may divide the murænoid species into two groups: 1) those spawning in or rather over great depths and 2) those spawning in shallow water. To the former belong *Conger vulgaris*, *C. mystax* and probably also the fresh-water eel (further the parent forms of *L. lanceolatus* and *ingolfianus*), to the latter *Muræna helena*, *Ophichthys serpens* and other *Ophichthys*-species, the eggs of which I have been able to identify. The latter spawn in shallow water, inside the 200 or even the 100 m. line where their eggs and tiny larvae occur at the surface together with larvae of true coastal forms.

January 1912.

Explanation of Pl. III.

Fig. 1. *Conger vulgaris*, length: 125 mm; Stat. **106**, $^{25}/_{6}$ 1910, 36° 33′ N., 2° 00′ W., 65 meters wire out.

— 2. *Conger vulgaris*, length: 14 mm; Stat. **144**, $^{23}/_{7}$ 1910, 34° 31′ N., 18° 40′ E., 25 meters wire out.

— 3. *C.* (*Congromuræna mystax*), length: 128 mm; Stat. **204**, $^{27}/_{8}$ 1910, 38° 52′ N., 7° 43′ E., 65 meters wire out.

— 4. *C.* (*Congromuræna mystax*), length: 15 mm; Stat. **10**, $^{15}/_{12}$ 1908, 37° 21′ N., 16° 45′ E., 25 meters wire out.

— 5. *C.* (*Congromuræna*) *balearicus* aff. = *Leptocephalus Eckmani* Strömman, emend., length: 95 mm; Stat. **329**, $^{20}/_{7}$ 1911, 25° 32′ N., 52° 08′ W., 35 meters wire out.

— 6. *C.* (*Congromuræna*) *balearicus*, length: 89 mm; Stat. **13**, $^{19}/_{12}$ 1908, 39° 45′ N., 17° 30′ E., 65 meters wire out.

— 7. *Leptocephalus lanceolatus* Strömman, emend., length: 54 mm.; Stat. **263**, $^{16}/_{3}$ 1911, 36° 42′ N., 30° 36′ W., 47 meters wire out.

— 8. *Leptocephalus ingolfianus* Johs. Schmidt, n. sp., length: 79 mm.; Stat. **310**, $^{23}/_{7}$ 1911, 32° 03′ N., 39° 00′ W, 17 meters wire out.

— 9. *Leptocephalus Andreae* Johs. Schmidt, n. sp., length: 101 mm.; Stat. **331**, $^{25}/_{7}$ 1911, 35° 50′ N., 29° 53′ W., 35 meters wire out.

All the figures are reproductions from photographs of specimens preserved in formaline. Figs. 2 and 4 are microphotographs (× 11) by Dr. C. U. Maaløe, Copenhagen, the remaining figures photographs (× $1^{1}/_{8}$) by Pacht & Crone, Copenhagen.

The larval form of *Chlopsis bicolor* Raf.

By

Dr. ***Johs. Schmidt.***

Through Grassi and Calandruccio's work, later continued by Grassi, the larval forms of a series of Mediterranean eel-fishes have become known. In some cases, certainly, the detailed proof is wanting, but we have at any rate become acquainted with most of the generic types of larvae through the investigations of the Italian authors, and we may hope, according to Grassi's statement in his latest paper of 1910, that the, so far, preliminary notices will be followed by the long-expected, detailed proof.

The genera of Mediterranean eel-fishes still unknown in their larval stages are *Chlopsis* and *Todarus*; regarding the genus *Myrus*, Grassi and Calandruccio certainly state, that they have found the larva, but they give no evidence or description. This may also be expected in the complete work.

I propose to deal here with the larva of *Chlopsis*, which is not mentioned by Grassi and Calandruccio, but which has been taken during my investigations with the "Thor" in the Mediterranean. As might be expected, it belongs to quite a different type from the Mediterranean Leptocephali hitherto known, whilst, on the other hand, larvae of the same type have also been found in the Atlantic.

To describe the form is hardly necessary, as reference can be made to the figure. At first glance the larva somewhat resembles *Leptocephalus brevirostris*, but when we examine a little further into details, we see at once, that the two forms have nothing to

do with one another. I need not describe all details, but merely point out the advanced position of the anus in all my specimens; these vary from 3 cm. to a little over 6 cm. in length, and none of them are as yet in process of transformation. Among the Mediterranean Leptocephali a similar position of the anus is only known in the genera *Saurenchelys* and *Nettastoma*. The larva of *Chlopsis* is further remarkable to a special degree for its pigmentation. It possesses a similar row of mediolateral points to the larva of *Conger vulgaris*, but these are considerably smaller and closer together than in the latter. As can be seen from the figure, there is also a row of closely placed points along the upper part of the gut. Further, a row of very fine points is present along the posterior part of the anal fin.

The evidence that the larval form figured here belongs to *Chlopsis bicolor* Raf. is contained first of all in the number of myomeres, which in 14 specimens were found to vary between 131 and 136, ca. 48 being preanal. This number excludes almost all the eel-fishes known from the Mediterranean: *Anguilla*, *Conger*, *Congromuraena mystax*, *Muraena helena*, *Myrus*, *Nettastoma*, *Saurenchelys*, *Ophichthys serpens*, *imberbis*, *hispanus* and sp., in all of which I have counted the vertebrae myself. There remain *Muraena unicolor*, *Todarus brevirostris*, *Ophichthys coecus*, *Congromuraena balearica* and *Chlopsis bicolor*. Of these *Congromuraena balearica* (with *C. mystax*) is at once excluded owing to the fact, that my material of this species contains all transitional stages between metamorphosed, easily determinable specimens and the early larvae (see fig. 2 in my paper of 1912), which are totally different from the larva in question here. With regard to *Ophichthys coecus*, though the number of vertebrae is unknown to me, yet this species may be excluded owing to the fact, that the present larva belongs to quite a different type from the other *Ophichthys* larvae and has rays in all the unpaired fins. *Todarus brevirostris* I only know from Facciola's and Supino's descriptions and figures, from which its appears, that it has a much higher number of vertebrae

than the present larva. There now remain *Muraena unicolor* and *Chlopsis bicolor* of the eel-fishes known in the Mediterranean. According to Grassi the former has 136—140 vertebrae, whilst the latter according to Supino has 133.

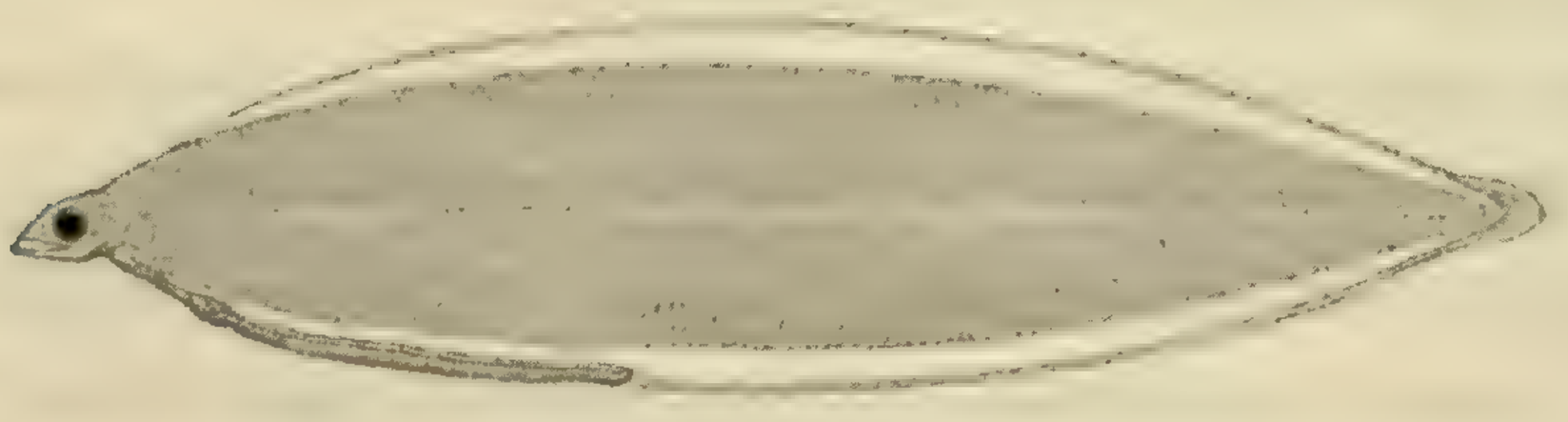
This shows already, that our larva belongs to *Chlopsis* and the position of the anus so far forward also indicates this. This position is found in *Chlopsis*, whereas in *Muraena unicolor* the anus is placed further back, and we have no cases among Leptocephali of the anus moving backwards during metamorphosis. The position of the nostrils also corresponds to the condition in *Chlopsis*, as also the tubular, anterior nostril, a feature that can be quite well detected in the oldest of my larval specimens. Lastly, the structure of the tail in the larva agrees with that in *Chlopsis*. Both the last and second-last hypural elements are broad plates the last bearing 5 or 4 and the second-last 3 or 4 rays.

Among all the characters I have examined, none stands in the way of referring the larva to *Chlopsis*; on the contrary, they all show agreement. The fact that the larva has large pectoral fins (without rays), whilst such are wanting in *Chlopsis*, is not different to what we find in the larvae of other eel-fishes without pectorals, for example *Nettastoma melanurum*.

According to our investigations with the "Thor", *Chlopsis* occurs in all basins of the Mediterranean and it must be one of the commonest species. (It seems to belong to the Muraenoids which spawn in summer and autumn). It is remarkable, therefore, that the larva has not been found at Messina by the Italian naturalists, who have made such rich collections of Leptocephali there; but it does not occur either in the collections of Leptocephali from Messina, which I have at my disposal.

To the same type as the larva of *Chlopsis bicolor* belongs *Leptocephalus hyoproroides*, described by Strömman from the western part of the Atlantic, of which I have had the opportunity to examine the original specimen through the kindness of the

Director of the Zoological Museum at Upsala[1]). Quite similar Leptocephali occur in collections made for Kommissionen for Havundersøgelser by H. M. S. "Ingolf" at in the neighbourhood of the



Chlopsis bicolor Rat.

Larva 58 mm. in length. "Thor" Stat. 156, 32° 24′ N. Lat., 26° 51′ E. Long., July 30, 1910.

West Indies. These show, that the genus *Chlopsis* is not restricted to the Mediterranean, but is also represented in the western part of the Northern Atlantic.

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[1]) I may take this opportunity to repeat, that the Leptocephalus described by me in 1909 under the name of *L. hyoproroides* has nothing to do with Strömman's species of that name. I had overlooked, that this name was already occupied and I have later given my species the name *Leptocephalus thorianus* (see Zool. Anzeiger, XXXVI, 1910).

25. March 1912.

Report on the Malacostraca collected by the "Tjalfe"-Expedition, under the direction of cand. mag. Ad. S. Jensen, especially at W. Greenland.

By

K. Stephensen.

During the fisheries-investigations carried out by Mr. Ad. S. Jensen in the Greenland seas, especially at S. W. Greenland, with the "Tjalfe" in the summers 1908 and 1909, a considerable material of Crustaceans was collected. Especially bathypelagic species and larvæ of such species are richly represented in the collection, this expedition standing foremost among those, by which such material has been brought to light. It was, however, by no means the whole material of Crustaceans, which was preserved, particularly of the more common species, the main object of the expedition being fisheries-investigations, not a general survey of the marine fauna.

The material contains in all 84 species and 6 species of larvæ. The following species are new to science.

Cleonardo microdactylus. (No. 57).

Eusirus Tjalfiensis. (No. 67).

Munneurycope Tjalfiensis. (No. 80).

Holophryxus Acanthephyræ. (No. 84).

Besides these the following species are new to Greenland:

Longithorax fuscus H. J. Hansen.

Scina sp.

Cyphocaris anonyx Boeck.

Metacyphocaris Helgæ Tattersall.

Katius obesus Chevreux.

Amphitopsis longicaudata Boeck.

Acanthoniscus typhlops G. O. Sars.

Janthe laciniata G. O. Sars.

Holophryxus Richardi Koehler.

A summary and discussion of the new localities in connection with those previously known I have given recently in the Report on the Malacostraca, Pycnogonida and some Entomostraca collected by the Danmark-Expedition to North-East Greenland, in "Meddelelser om Grønland", vol. 45, 1912.

Some of the stations from the Davis-Strait having great interest, a complete list is given here of all the species brought home from these stations.

St. 322. 60° 07′ N, 48° 26′ W, 3—5—1909. 2000 m. wire out.

Acanthephyra purpurea ca. 15 spec.
Parapasiphae sulcatifrons 2 spec.
Gennadas elegans 7 spec.
Sergestes arcticus 4 spec.
Thysanopoda acutifrons 30 spec.
Meganyctiphanes norvegicus 7 spec.
Thysanoessa longicaudata many spec. (ca. 15 cm.^{3})
Eucopia unguiculata 5 spec.
Gnathophausia zoea 2 spec.
Boreomysis microps 7 spec.
Longithorax fuscus 1 spec.
Hyperia medusarum 1 spec.
Euthemisto compressa 6 spec.
Cyphocaris anonyx 5 spec.
Katius obesus 2 spec.
Metacyphocaris Helgæ 6 spec.
Munneurycope Tjalfiensis 1 spec.
Holophryxus Acanthephyræ 1 spec.

St. 333. 63° 18′ N, 54° 55′ W, 7—5—1909. depth 1300 m., 1530 m. wire out.

Acanthephyra purpurea 12 spec.
Parapasiphae sulcatifrons 4 spec.
Gennadas elegans ca. 15 spec.
Sergestes arcticus 1 spec.
Eucopia unguiculata ca. 25 spec.
Gnathophausia zoea 5 spec.
Boreomysis microps ca. 20 spec.
Cyphocaris anonyx 2 spec.
Katius obesus 2 spec.
Metacyphocaris Helgæ 5 spec.
Lanceola serrata 1 spec.

St. 338. 64° 01′ N, 55° 30′ W, 8—5—1909. depth 1185 m. 1500 m. wire out.

Acanthephyra purpurea 11 spec.
Parapasiphae sulcatifrons 5 spec.
Gennadas elegans 13 spec.
Boreomysis microps ca. 20 spec.
Scina sp. 1 spec.
Cyphocaris anonyx 2 spec.
Katius obesus 1 spec.
Metacyphocaris Helgæ 2 spec.

St. 336. 64° 06′ N, 55° 18′ W, 8—5—1909. depth 1040—1100 m., 1200 m. wire out.

Acanthephyra purpurea 10 spec.
Parapasiphae sulcatifrons 6 spec.
Gennadas elegans ca. 25 spec.
Sergestes arcticus 1 spec.
Thysanoessa longicaudata 1 spec.
Eucopia unguiculata 6 spec.
Gnathophausia zoea 7 spec.
Boreomysis microps ca. 25 spec.
Cyphocaris anonyx 2 spec.
Cleonardo microdactylus 2 spec.

Decapoda.

1. **Chionoecetes Opilio** O. Fabr.

Cancer Phalangium O. Fabricius, Fauna Groenlandica, 1780, No. 214, p. 234.
— *Opilio* O. Fabricius, Kgl. Danske Vid. Selsk. Skrifter, Nye Samling, vol. 3, 1788, p. 181, 1 Pl.
Chionoecetes Opilio Kröyer, Naturh. Tidsskrift, vol. 2, 1838, p. 249.
* — — Kröyer, Crust., in Gaimard, Voyage en Scand., 1846 (1849?), Pl. 1.
— — M. Rathbun, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 74, Pl. 4, fig. 5—7.
— — A. M. Edwards & Bouvier, Rés. des Camp. Sc. "Hirondelle", Monaco, vol. 7, 1894, p. 16.
— — H. J. Hansen, "Ingolf" 1908, p. 12.
— *phalangium* H. J. Hansen, V. Grönland 1887, p. 28.

(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fath. 5—7—1908. 3 spec.
(St. 107) 68° 20′ N, 54° 03′ W, 220—280 fath. 9—7—1908. 1 spec. (the carapace 93 mm. × 93 mm.)

In Disko Bay and in Umanak Fjord considerable numbers of this crab were taken in deep water (140—260 fms.), the largest specimen measuring 30 inches between the tips of the longest legs.

2. **Hyas coarctatus** Leach.

Hyas coarctatus Leach, Transact. Linn. Soc., London, vol. 11, 1815, p. 329.
— — Cuvier, Règne animal, Edit. acc. de planches grav., Crust., Pl. 32, fig. 3.
* — — Brandt, Middendorffs Sibirische Reise. vol. 2, 1, 1851, p. 81.
* — — Bell, 1853, . 35, with fig.
— — M. Rathbun, Proc. U. S. Nat. Mus., vol. 16, 1893 p. 69.

Hyas coarctatus H. J. Hansen, „Ingolf" 1908, p. 15.
— — V. Grönland 1877, p. 30.

(St. 465) 62° 58′ N, 50° 52′ W, ca. 25 fath., 21—6—1909. 7 spec.
(St. 419) 65° 09′ N, 53° 33′ W, 29 fath. 6—6—1909. 1 spec.
(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fath., 5—7—1908. ca. 20 spec.

3. **Lithodes Maja** L.

Cancer Maja Linné, Systema Naturæ, edit. X, 1758, vol. 1, p. 629.
Lithodes arctica Cuvier, Règne animal, Edit. acc. de planches grav., Crust., Pl. 37.
* — ***Maja*** Bell, 1853, p. 165, with fig.
* — *arctica* Bouvier, Ann. Sc. Nat. Zool., ser. 7, vol. 18, 1891, p. 181, Pl. 11, fig. 7, Pl. 12, fig. 5.
— *Maja* Bouvier, ibid., ser. 8, vol. 1, 1896, p. 24.
— — H. J. Hansen, "Ingolf", 1908, p. 22.
— — — V. Grønland, 1887, p. 31.

(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fath., 5—7—1908, 1 spec.
Without locality, 1 sp.

4. **Eupagurus pubescens** Kr.

Pagurus pubescens Kröyer, Kgl. Danske Vid. Selsk. naturvid.-math. Afh., vol. 7, 1838, p. 314.
* — — Kröyer, Naturhist. Tidsskrift, vol. 2, 1838, p. 251.
* — — — in Gaimard: Voyage en Scandinav., 1846 (1849?). Pl. 2, fig. 1.
Eupagurus — — *E. Kröyeri* S. J. Smith, Transact. Conn. Acad. vol. 5, 1879. p. 47, 48.
— — A. M. Edwards & Bouvier, Résult. d. Camp. Sc. "Hirondelle", Monaco, vol. 7, 1894, p. 74.
— — H. J. Hansen, "Ingolf", 1908, p. 27.
— — — V. Grönland, 1887, p. 32.

(St. 177) 70° 42′ N, 54° 48′ W, 253 fath. 7—8—1908. 2 spec.

5. **Munida tenuimana** G. O. Sars.

Munida tenuimana G. O. Sars, Vid. Selsk. Forh., Christiania 1871 (1872), p. 247.
— — — Ibid. 1882, No. 18, p. 44, Pl. 1, fig. 6.
* — — Appellöf, Die Decap. Crust., Meeresfauna v. Bergen, Heft 2—3, 1906, p. 139—49, Pl. 2, fig. 2.
* — — H. J. Hansen, "Ingolf" 1908, p. 34, Pl. 2, fig. 4 a, Pl. 3, fig. 1 a.

(St. 429) 63° 54′ N, 53° 15′ W. 988—1400 m. trawl. 8—6—1909. 3 spec.

6. **Munidopsis curvirostra** Whiteaves.

Munidopsis curvirostra Whiteaves, Ann. Journ. Science ser. 3, vol. 8, 1874, p. 212.
— — S. J. Smith, Bull. Mus. Comp. Zool., vol. 10, 1884, p. 21 (no description), Pl. 8, fig. 2, 3, 3 a.
* — *longirostris* A. Milne-Edwards & Bouvier, Exp. Sc. "Travailleur" et "Talisman" Crust. Decap. vol. 1, 1900, p. 314, Pl. 4, fig. 1, Pl. 30, fig. 6—10.
* — *curvirostra* H. J. Hansen, "Ingolf", 1908, p. 36, pl. 3, fig. 2.

(St 337) 64° 05′ N, 55° 20′ W, 1100 m. 8—5—1909. 1 spec.
(St. 408—10) 64° 14′ N, 55° 55′ W, 839 m. 2—6—1909. 3 spec.
(St. 302) 64° 40′ N, 56° 37′ W, 720—775 m. 2—6—1909. 2 spec.

6. **Sclerocrangon boreas** Phipps.

Cancer Boreas Phipps, Voyage towards the North Pole, 1774, p. 190, Pl. 12, fig. 1.
**Crangon* — Kröyer, Naturhist. Tidsskrift vol. 4, 1842, p. 218, Pl. 4. fig. 1—14.
Sclerocrangon Boreas H. J. Hansen, "Ingolf" 1908, p. 47.
— — — V. Grønland, 1887, p. 33.

(St. 371) 66° 44′ N, 56° 16′ W, ca. 150 fm. 20—5—1909. 1 spec. (72 mm.)
(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fm. 5—7—1908. 1 spec. (73 mm.)

The great depths have some interest, as H. J. Hansen (Ingolf, p. 48) writes: "It was taken at all depths from ca. 5 fm. to 118 fm., but a single occurrence at 200 fm. must . . . be considered as less certain".

8. **Sabinea hystrix** A. Milne-Edwards.

Paracrangon hystrix A. Milne.Edwards, Ann. Sc. Nat., ser. 6, Zool., vol. 11, 1881, p. 6.
**Sabinea princeps* S. J. Smith, Bull. Mus. Comp. Zool., vol. 10, 1882. p. 38, Pl. 8, fig. 1.
— *hystrix*, H. J. Hansen, "Ingolf", 1908, p. 51.

(St. 337) 64° 05′ N, 55° 20′ W, 1100 m. 8—5—1909. 1 spec. (110 mm.)

9. **Nectocrangon lar** Owen.

Crangon lar Owen, Zool. of Capt. Beechey's Voyage, 1839, p. 88, Pl. 28, fig. 1.
**Argis* — Kröyer, Naturh. Tidsskrift, vol. 4, 1842, p. 255, Pl. 5, fig. 45—62.
Nectocrangon lar + *N. dentata* M. Rathbun, Harriman Alaska-Exp., 1904, p. 137 with figs.) (teste H. J. Hansen, Ingolf).

Nectocrangon lar H. J. Hansen, "Ingolf", 1908, p. 49.
— — — V. Grönland, 1887, p. 37.

(St. 183) 69° 19′ N, 52° 56′ W. 78 fm., 10—8—1908, 1 spec.
(St. 179) 69° 29′ N, 55° 26′W, 116 fm., 8—8—1908, 1 spec.

10. **Spirontocaris spinus** Sow.

Cancer spinus Sowerby, Brit. Miscellany, 1806, p. 47, Pl. 23.
**Hippolyte Sowerbei* Kröyer, Danske Vid. Selsk. math.-naturvid. Afh., vol. 9, 1842, p. 298, Pl. 2, fig. 45—54.
— *spinus* Hoek, Niederl. Arch f. Zool., Supplbd. I, Crust., 1882, p. 15, Pl. 1, fig. 4—7.
* — — Birula, Ann. Mus. Zool. Acad. Imp. St. Pétersbourg, vol. 1, 1899, p. 30, fig. 1.
Spirontocaris spinus H. J. Hansen, "Ingolf", 1908, p. 58.
— — Kemp, Decap. Ireland, 1908 (1910), p. 103, Pl. 14, fig. 1.
Hippolyte — H. J. Hansen, V. Grønland, 1887, p. 41.

(St. 371) 66° 44′ N, 56° 16′ W, ca. 150 fm. 20—5—1909. 1 spec.

11. **Spirontocaris Gaimardii** H. Milne-Edwards.

Hippolyte Gaimardii H. Milne-Edwards, Hist. Nat. Crust., vol. 2, 1837, p. 378.
* — — + *H. gibba* Kröyer, Kgl. Danske Vid. Selsk. math.-naturv.-Afh., vol. 9, 1842, p. 282, 288, Pl. 1, fig. 21-30, Pl. 2, fig. 31—37.
Euales obses J. Thallwitz, Decapoden-Studien 1891, p. 23.
Hippolyte Gaimardii Appellöf, Decap. Crust., Meeresfauna v. Bergen, Heft 2—3, 1906, p. 122, Pl. 2, fig. 4.
Spirontocaris — H. J. Hansen, "Ingolf" 1908, p. 56.
Hippolyte — — V. Grönland, 1886, p. 39.

(St. 183) 69° 19′ N, 52° 56′ W, 78 fm. 10—8—1908, 7 spec.
(St. 179) 69° 29′ N, 55° 26′ W, 116 fm. 8—8—1908, 6 spec.

The largest specimen, from St. 179, is 93 mm. long. On one spec. the rostrum is bent upwards about as in *Pandalus propinquus*. All the specimens have a large curved process on the third abdominal segment, except the smallest specimen (44 mm.), which has but an inconsiderable tooth.

12. **Spirontocaris macilenta** Kr.

Hippolyte macilenta Kröyer. Naturh. Tidsskrift vol. 3, 1841, p. 574.
* — — — Kgl. Danske Vid. Selsk. math.-naturvid. Afd., vol. 9, 1542, p. 305, Pl. 2, fig. 55—56.

Hippolyte macilenta S. J. Smith, Transact. Conn. Acad. vol. 5, 1879, p. 71.
Spirontocaris — H. J. Hansen, "Ingolf" 1908, p. 60.
Hippolyte — — V. Grønland, p. 43.

(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fm. 5—7—1908. 1 spec.
(St. 183) 69° 19′ N, 52° 56′ W, 75 fm. 10—8—1908. 7 spec.
(St. 179) 69° 29′ N, 55° 26′ N, 116 fm. 8—8—1908. 5 spec.

The species seems to be very rare at W. Greenland (H. J. Hansen l. c.). 3 of the spec. from St. 179 are infested with *Phryxus abdominalis*, and on one spec. from St. 100 *Bopyroides hippolytes* was found; till now the species was not known as a host for any of these Bopyridæ.

13. **Spirontocaris turgida** Kr.

Hippolyte turgida + *H. Phippsii* Kröyer, Naturh. Tidsskrift vol. 3, 1841, p. 575.
* — — — — Kgl. Danske Vid. Selsk. math.-naturvid. Afh., vol. 9, 1842, p. 308, 314, Pl. 2, fig. 57—58, Pl. 3, fig. 59—68.
— *Phippsii* S. J. Smith, Transact. Conn. Acad., vol. 5, 1879, p. 73.
Spirontocaris turgida H. J. Hansen, "Ingolf" 1908, p. 61.
Hippolyte Phippsii — V. Grønland 1887, p. 43.

(St. 165) 62° 58′ N, 50° 52′ W, ca. 25 fm. 21—6—1909. 3 spec.

On one spec. the Bopyrid *Phryxus abdominalis* was found.

14. **Spirontocaris polaris** Sab.

Alpheus polaris Sabine, Suppl. to the App. of Capt. Parry's Voyage, 1824, p. 238, Pl. 2, fig. 5—8.
**Hippolyte polaris* + *H. borealis* Kröyer, Kgl. Danske Vid. Selsk. math.-naturvid. Afh., vol. 9, 1842, p. 324, 330, Pl. 3, fig. 74—81, Pl. 4, fig. 82.
— — S. J. Smith, Transact. Conn. Acad. vol. 5, 1879, p. 80.
— *Amazo* Pfeffer, Jahrb. wiss. Anst. Hamburg, vol. 3, 1866, p. 36, fig. 6.
Spirontocaris polaris H. J. Hansen, "Ingolf" 1908, p. 63.
Hippolyte — — V. Grønland, 1887, p. 45.

(St. 465) 62° 58′ N, 52° 52′ W, ca. 25 fm. 21—6—1909. ca. 60 spec.
(St. 419) 65° 09′ N, 53° 33′ W, 29 fm. 6—6—1909. 1 spec.
(St. 371) 66° 44′ N, 56° 16′ W, ca. 150 fm. 20—5—1909. 1 spec.

One of the specimens from St. 465 is infested with *Bopyroides hippolytes*.

15. **Pandalus borealis** Kr.

Pandalus borealis Kröyer, Naturh. Tidsskrift vol. 2, 1838, p. 254.
— — — Ibid., Ny Række, vol. 1, 1845, p. 461.
— — — in Gaimard, Voyage en Scand., 1846 (1849?). Crust, Pl. 6, fig. 2.
* — — G. O. Sars, Report on Norw. Fish- and Marine-Invest. vol. 1, 1900, No. 3, p. 31, Pl 9—10.
— — H. J. Hansen, "Ingolf" 1908, p. 70.
— — — V. Grønland, 1887, p. 49.

The Channel outside Nanortalik (ca. 60° N), 6—9—1909. 5 spec., from stomachs of Gadus ogak.
(St. 341) 64° 34′ N, 53° 20′ W, 200 m. wire, 9—5—1909. 9 spec.
(St. 183) 69° 19′ N, 52° 56′ W, 78 fm. 10—8—1908. 2 spec.

The specimens from St. 341 have very large eyes.

This shrimp was otherwise taken very often, sometimes in great numbers, as e. g. W. of "Store Hellefiske" bank, where in a depth of 175 fms. many liters were taken in one haul with otter-trawl: the largest specimens measured 15.5 cm. in length (30 cm. with the antennæ).

16. **Pandalus propinquus** G. O. Sars.

Pandalus propinquus G. O. Sars, Forh. Vid. Selsk. Christiania 1869 (1870), p. 148.
— — S. J. Smith, Rep. U. S. Comm. Fish and Fisheries 1885 (1886) Pl. 13, fig. 1.
— — Calman, Ann. Mag. Nat. Hist. ser. 7, vol. 3, 1899, p. 32, Pl. 1—4, fig. 2.
— — H. J. Hansen, "Ingolf" 1908, p. 72.
— — Kemp, Decap. Natant, Ireland, 1908 (1910), p. 89, Pl. 11, fig. 1—4.

(St. 429) 63° 54′ N, 53° 15′ W, 988—1400 m. trawl. 8—6—1909. 1 spec.

17. **Acanthephyra purpurea** A. Milne-Edwards.

Acanthephyra purpurea A. Milne-Edwards, Comp. Rend. Ac. Sc. Paris, vol. 93, 1881, p. 933.
**Miersia Agassizii* S. J. Smith, Bull. Mus. Comp. Zool. vol. 10, 1882, p. 67, Pl. 11, fig. 5—7, Pl. 12, fig. 1—4.
**Acanthephyra purpurea* Kemp, Fisheries, Ireland, Sci. Invest. 1905 part 1 (1906), p. 4—16, Pl. 1, Pl. 2, fig. 1—3 (ubi Litt. et Syn.).
— — H. J. Hansen, "Ingolf" 1908, p. 75.

Acanthephyra purpurea Kemp, Decap. Natant. Ireland, 1908 (1910) part I, p. 56.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909. 15 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1530 m. wire, 7—5—1909. 12 spec.
(St. 338) 64° 01′ N, 55° 30′ W, 1185 m. wire, 8—5—1908. 11 spec.
(St. 336) 64° 06, N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909, 10 spec.

H. J. Hansen (l. c.) mentions the species from 6 stations, but he has only 1 spec. from each stat. Kemp (1908, l. c.) mentions the species from 32 stations (6 of which are from the Danish investigations steamer "Thor"), but he has, as Hansen, from most of the stations only 1 specimen; the largest number from a single stat. is five, and that is but a single occurrence.

One of the specimens from St. 322 is infested with *Holophryxus Acanthephyræ* K. St. (fam. Dajidæ) (No. 84).

18. **Pasiphae tarda** Kr.

Pasiphae tarda Kröyer, Naturh. Tidsskrift, ser. 2, vol. 1, 1844—45, p. 453.
— — — in Gaimard, Voyage en Scandinavie, 1846 (1849) Crust., Pl. 6, fig. 1.
Pasiphae norvegica M. Sars, Bidrag til Kundskaben om Kristianiafjordens Fauna, Nyt Magasin f. Naturvid, vol. 15, 1868, p. 282, Pl. 4, Pl. 5, fig. 81, fig. 87—90.
— *tarda* G. O. Sars, Oversigt af Norges Crust., Vid. Selsk. Forhandl., Kristiania, 1882, No. 18, p. 48.
— — H. J. Hansen, "Ingolf" 1908, p. 78.
— — — V. Grønland, 1887, p. 51.
— — Wollebæk, Decap. Crust. 1—2. Bergens Musæums Aarbog 1908, No. 12, p. 72, Pl. 13.
— — K. Stephensen, Revideret Fortegn. over Danmarks marine Arter af Decap., Vid. Meddel. Naturh. Foren. København 1909 (1910) p. 289.
* — — Kemp, Decap. Natant. Ireland 1908 (1910) p. 39—42, Pl. 4, fig. 8—11.
— *princeps* S. J. Smith, Rep. Decap. Crust. "Albatross" East coast U. S., Rep. U. S. Fish Commission 1882 (1884) p. 381, Pl. 5. fig. 2.
— — S. J. Smith, Report on the Decap. Crust. "Albatros" Eastcoast U. S., Rep. U. S. Fish Commission 1885 (1887), p. 609, 612, 613, 617, 619, 682.
— — Kemp, Decap. Natant. Ireland, 1908 (1910) p. 42—47, Pl. 4, fig. 1—7.

(St. 15) 58° 08′ N, 39° 24′ W. 500 m. wire, 26—5—1908. 2 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m., 1300 m. wire, 23—6—1908. 1 spec.
(St. 429) 63° 54′ N, 53° 15′ W, 988—1400 m. 8—6—1909. 1 spec.
(St. 407—08) 64° 14′ N, 55° 55′ W, 839 m. clay, 2—6—1909. 1 spec.

Kemp (l. c. 1908 (1910) p. 42—43) has given a synopsis of the characteristics of *P. tarda* Kröyer and *P. princeps* S. J. Smith. Kröyer has published his description in Danish, and it seems that owing to this foreigners have not been able to read his description; otherwise Smith would probably not have founded *P. princeps* as a new species. In order to show the great agreement in the descriptions of Kröyer and Smith, I have made the following synopsis of the most important characters.

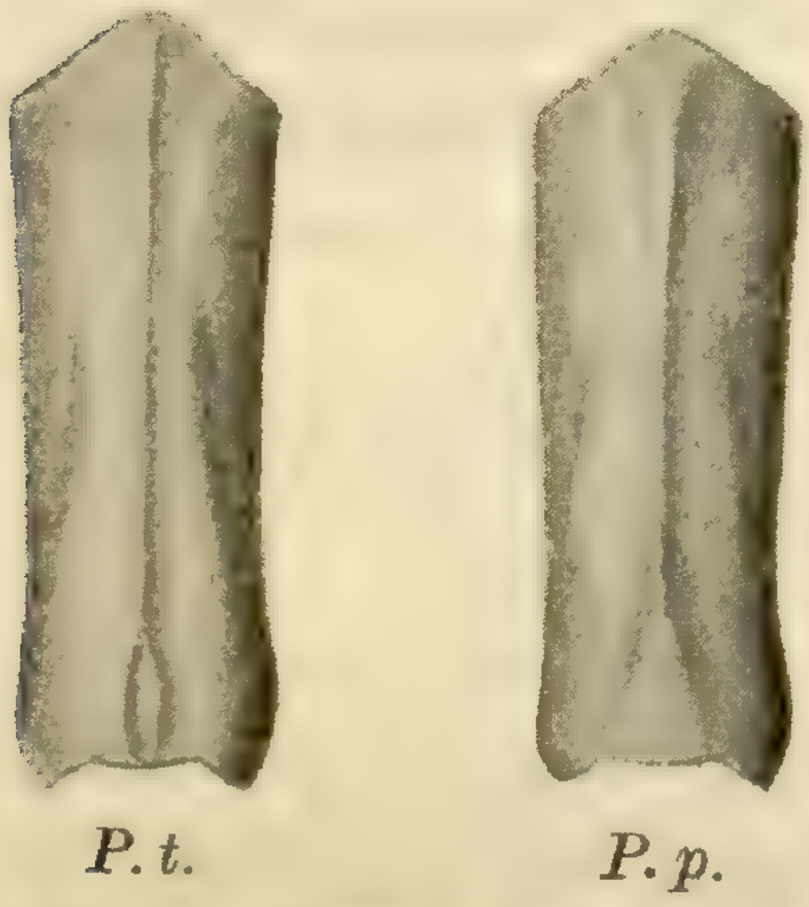
P. tarda Kröyer. (Naturhist. Tidsskrift, ser. 2, vol. 1, 1844—45, p. 453 seq.)	*P. princeps* S. J. Smith. (Report U. S. Fish Commission for 1882 (1884), p. 381 seq.)
1. "The carapace, which is about 1/3 of total length or half as long as the pleon including telson, is very much compressed". (From Kröyer's fig. in Gaimard: Voyage en Scandinavie, the carapace is seen to be 39 mm., abdomen excluding telson 59 mm.).	1. The pleon exclusive of the telson is about one half longer than the carapace". (Carapace 75 mm., pleon excluding the telson 112 mm.).
2. "On the dorsum of the carapace is seen a sharp, but smooth carina, which goes about to the hinder edge of the carapace, terminating anteriorly in a little, mucronate and very much compressed rostrum, that .... projects a little the anterior edge of the carapace".	2. "The dorsum of the carapax is rounded except for about a third of the length anteriorly, where it rises into a carina terminating in a short, mucronate and obliquely upturned rostrum overhanging, but projecting scarcely as far forwards as the front itself, which is prominent though rounded in outline as seen from above".

3. "The antennal scale is large ...., lengthened ovate (more than 3 times as long as the breadth), apically rounded, without spines[1])" (the length is (in the fig. in Gaimard: Voyage) 17 mm., the breadth 4 mm.).	3. Antennal scale is .... scarcely a third as broad as long, and the outer edge arcuate and terminating in an acutely triangular lamellar tooth" (scale: length 29 mm.) breadth 8.8 mm.).
4. "The abdomen is provided along the whole middle line of the dorsum with a very conspicuous carina."	4. "The second, third, fourth and fifth somites are dorsally carinate, the fourth and fifth most conspicuously. The sixth somite is .... compressed, but scarcely carinated dorsally".
5. (Telson) "The tip is strongly cut into a sharp angle".	5. (Telson) "The tip (is) divided by a narrow sinus".
6. (Second pair of pereiopods). "The second joint has on the lower edge towards the end 3 spines" (about the third joint Kröyer says nothing).	6. "The second pair (of pereiopods) are armed with a few small spines along the lower edge of the propodus, and the lower distal angle of the carpus is produced into a sharp spine, but are otherwise nearly like the first pair ... (smooth, naked and unarmed").

[1]) About this G. O. Sars writes (Christiania Vid. Selsk. Forh. 1882, No. 18, Oversigt af Norges Crustaceer, p. 48) (in translation from Norwegian): "I have had opportunity myself to examine the type-specimen of Kröyer in the Copenhagen-Museum and have convinced myself that the spine in the antennal plate originally has been present, but has accidentally been broken in the present specimen". — At the present moment (1912) we have in the Zoological Museum in København (Copenhagen) only the mentioned specimen from the time of Kröyer, provided with the following note (in the hand writing of J. C. Schiödte), "*Pasiphae tarda* Kr. Sydl. Grønland: Jørgensen Kr." Unquestionably it is this specimen, about which Kröyer writes (l. c., 1844—45: the foot-note p. 455) "in one of the specimens the carina anteriorly had an incision, that made, so to speak, two humps; but this seems to be caused by an accidental damage".

As it may be seen the agreement is very close. The differences are not greater, than that they may be ascribed to individual variations (we must remember, that Kröyer had but two specimens, Smith even but one specimen).

The Zoological Museum in Copenhagen has a very large material, towards 1000 specimens of *P. tarda* Kr., of which the greater part has been captured in the Skagerak. To convince myself, that there were no specimens of *P. princeps* Smith in the material, that hitherto (by H. J. Hansen in "Ingolf" 1908 and by myself in "Vid. Meddel. Naturh. Foren." Kbhvn. 1909) has been determined as *P. tarda* Kr., I have examined each of the specimens, but the result has been quite different from what might be expected, as will be seen from the following.



P. t. *P. p.*

Fig. 1. Dorsal view of the 6th abdominal segment of *Pasiphae tarda* and *Pasiphae princeps*.

Kemp is right, that a great part of the specimens may be referred to one of the two principal forms; but as my investigations have shown, they are combined with numerous intermediate links.

Rostrum varies so much, that it can not be used as a distinguishing character. The best characters are, according to my investigations, the sixth abdominal segment, the antennal plate and the spines of the basis of the second pereiopod; but these spines are not to be found in specimens smaller than 25—40 mm., and even in larger specimens their number is varying. G. O. Sars says (l. c. 1882, p. 48) "the number of spines in the two first pairs of pereiopods is a characteristic too inconstant to be considered as a real specific characteristic". Nevertheless we may in most cases use the characteristic of Kemp (l. c. 1908 (1910) p. 42—43) to separate the two "species" (specimens more than 30—40 mm. long).

Besides I have found a characteristic, that I have not seen

described anywhere in the literature, viz. the carina in the sixth abdominal segment. This carina goes in the specimens, that from the antennal plate and the second pereiopod are to be ascribed to *P. tarda*, just to the hind edge of the segment (fig. 1), but is in the hinder part divided into two almost parallel carines; in *P. princeps* the hinder part of the segment is simply compressed without any carina (fig. 1).

That the proportion in the length of antennal plate, carapace and abdomen cannot be used, appears from the following measurements; the specimens are determined from the shape of antennal plate, carapace and sixth abdominal segment) (the measurement are in mm.)

P. tarda

Locality	Total length	Antennal plate	Carapace	Abdomen excl. telson
Skagerak	83	12	25	46
—	70	10	21	40
—	79	12	24	44
—	68	9,5	20	30
—	101	14	33	65
62° 49′ N, 18° 46′ W.	73	11	23	42

P. princeps.

Locality	Total length	Antennal plate	Carapace	Abdomen excl. telson
S. Greenland (Kröyer's type—specimen of *P. tarda*!)	108	imperfect	38	58
67° 19′ N, 15° 52′ W.	60	10	19	33
65° 28′ N, 27° 29′ W.	90	13	25	48

Even the form of the antennal plate may cause some difficulty. Thus I have seen one, otherwise somewhat typical *P. tarda* from the Skagerak, whose right antennal plate is as in *P. princeps*, whilst the left has the same form as in *P. tarda* (Kemp l. c., 1908 (1910), pl. 4, fig. 9); but from the measurements (antennal plate 10,5, carapace 23, abdomen excl. telson 38) it might be determined as *P. princeps*.

Of *P. norvegica* M. Sars, that in all essentials is like Kemp's description of *P. tarda*, G. O. Sars writes: (l. c. 1882, p. 49) "there is no doubt that the species *P. norvegica* described by my father ... is identic with the species of Kröyer". That upon the whole the single specimens determined by Kröyer as *P. tarda* suit the description of *P. princeps*, is evident from the agreement of the descriptions of Kröyer and Smith, and as the two "species" are combined with intermediate links, we must unquestionably obliterate *P. princeps* Smith as species and take the name but as syn. of *P. tarda* Kröyer.

19. **Parapasiphae sulcatifrons** S. J. Smidt.

Parapasiphae sulcatifrons S. J. Smith, Rep. Comm. Fish and Fishery for 1882, (1884) p. 384 Pl. 5, fig. 4, Pl. 6, fig. 1—7
— — H. J. Hansen, "Ingolf" 1908, p. 79.
* — — Kemp, 1908 (1910), p. 47, Pl. 5.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m., wire, 3—5—1909. 2 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1905. 5 spec.
(St. 338) 64° 01′ N, 55° 30 W, 1185 m., 1400—1500 m. wire, 8—5—1909. 5 spec.
(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909. 6 spec.
(St. 348) 64° 35′ N, 56° 18′ W, 900 m. wire, 11—5—1909. 4 spec.

New to W. Greenland. The largest specimen is from St. 333 and is 71 mm. long.

20. **Gennadas elegans** S. J. Smith.

Amalopenæus elegans S. J. Smith, Bull. Mus. Comp. Zool. vol. 10, 1882, No. 1, p. 87, Pl, 14, fig. 8—14, Pl. 15, fig. 1—15.
**Gennadas* — Bouvier, Rés. Comp. Sc., Monaco, fasc. 33, (Pénéides), 1908, p. 25 (distrib.), p. 28 (key to the species of the genus) p. 35 (Syn. and litt.).
— — Bouvier, Bull. Mus. Océan. Monaco, No. 80, 1906.
Amalopenæus — Calman, Ann. Mag. Nat. Hist. ser. 7, vol. 11, 1903, p. 416.
Gennadas — H. J. Hansen, "Ingolf" 1908, p. 81.
**Amalopenæus* — Kemp, 1908 (1910), p. 14, Pl. 1.
— — H. J. Hansen, V. Grønland 1887, p. 52.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 7 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909, 7 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1909, 15 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m., 1000 m. wire, 23—6—1908, 1 spec.
(St. 338) 64° 01′ N, 55° 30′ W, 1185 m., 1400—1500 m. wire, 8—5—1909, 13 spec.
(St. 336) 64° 06′ N. 55° 18′ W, 1200 m. wire, 8—5—1909, ca. 25 spec.
(St. 408) 64° 14′ N. 55° 55′ W, 839 m. (trawl), 2—6—1909, 1 spec.
(St. 348) 64° 35′ N, 56° 18′ W, 900 m. wire, 11—5—1909, 6 spec.

It is very interesting, that the "Tjalfe" has taken so many specimens at each station; in "Ingolf" H. J. Hansen mentions but one specimen from each station; only at 2 stations were taken 2 specimens. The material from the "Tjalfe" thus fully confirms, what Bouvier says (Bull. Inst. Océanogr., Monaco, No. 97, 1907, p. 47—46): "le Gennadas élégans est l'espèce la plus commune du genre: il fut considéré comme une espèce rarissime aussi longtemps qu'on se borna aux pêches sur le fond; mais, depuis l'emploi du filet vertical, surtout de celui a grande ouverture, il apparâit très commun et doit être considéré comme un des éléments les plus caractéristiques de la faune bathypélagique dans nos régions. En Méditerranée, près des îles Baléares, et au centre de l'Atlantique, dans les régions des Sargasses, certains coups de filet nous donnérent jusqu'à trente spécimens de ce joli Pénéide. Au-dessus de 1000 mètres, on ne rencontre guère que les larves de l'espèce; au dessous apparaissent les adultes qui, d'ailleurs, ne semblent jamais se tenir sur le fond".

21. **Sergestes arcticus** Kr.

Sergestes arcticus Kröyer, Kgl. Danske Vid. Selsk. Skrifter, 5. Række, naturvid.-math. Afd., vol. 4, 1859, p. 240, Pl. 3, fig. 7, Pl. 5, fig. 16.
— — H. J. Hansen, "Ingolf" 1908, p. 82 (ubi litt. et syn.).
* — — Wasserloos, Zur Kenntnis d. Metamorphose von Serg. arct., Zool. Anzeiger, vol. 33, 1908, p. 327, with figs.
* — — Kemp, 1908 (1910), p. 30, Pl. 3, fig. 13—19.
— — H. J. Hansen, V. Grønland 1887, p. 52.

1. the stage *Sergestes Rinkii.*

(St. 1 a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, many spec. (1 cm.³)
(St. 1 b) — — surface — — (3 cm.³)

2. adults.

(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, 15 spec.
(St. 1 a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, 1 spec.
(St. 321) 60° 07′ N, 48° 26′ W, 600 m. wire, 3—5—1909, 10 spec.
(St. 322) — — 2000 m. wire, — 4 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909, 1 spec.
(St. 30 a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, 15 spec.
(St. 30 b) — — 70 m. wire, — 2 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1909, 1 spec.
(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909, 1 spec.
(St. 346) 64° 22′ N, 56° 00′ W, 800—400 wire, 10—5—1909, 1 spec.

The material states, that the species lives at W. Greenland; hitherto its occurrence there was doubtful (Kröyer).

The specimen from st. 346 in infested with *Holophryxus Richardi* Koehler (fam. Dajidæ) (No. 83).

Euphausiacea.

22. **Thysanopoda acutifrons** Holt & Tatt.

Thysanopoda pectinata H. J. Hansen, Bull. Mus. Océanogr., Monaco No. 30, 1905, p. 16, fig. 12.
— *acutifrons* Holt & Tattersall, Rep. Sea and Inland Fisheries, Ireland, 1902—03 (1905), pt. 2, app. No. IV, p. 102, 134.
— — H. J. Hansen, Bull. Mus. Océanogr. Monaco, No. 42, 1905, p. 22.
* — — Holt & Tattersal, Fisheries, Ireland, Sc. Invest.. 1904, pt. 5 (1906), p. 8, Pl. 1.
— — H. J. Hansen, "Ingolf" 1908, p. 84.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 6, fig. 4—5.
? — *microphthalma* Ortmann, Plankton-Exp., vol. 2, G. b. 1893, p. 9.
non — *pectinata* Ortmann, ibid., p. 10.

(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, ca. 40 spec.
(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, ca. 30 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m., 1000 m. wire, 23—6—1908, 1 spec.

New to W. Greenland.

23. **Meganyctiphanes norvegica** M. Sars.

Thysanopoda norvegica M. Sars, Forh. Skand. Naturforskermøde 1856 (1857), p. 169.
Nyctiphanes — G. O. Sars, Forh. Vid. Selsk. Christiania 1883, p. 24.
**Meganyctiphanes norvegica* Holt & Tattersall, Rep. Sea and Inland Fisheries, Ireland, 1902—03, pt. 2, No. IV, (1905), p. 105, 135, Pl. 16.
— — H. J. Hansen, "Ingolf" 1908, p. 85.
— — Zimmer, Nordisches Plankton, vol. 6, 1909. p. 8, fig. 8—9.
Nyctiphanes — Zimmer, Fauna arctica, vol. 3, 1904, p. 419.

(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, ca. 35 spec.
(St. 9) 58° 33′ N, 35° 55′ W, 600 m. wire, 17—5—1908, ca. 15 spec.
(St. 3) 58° 39′ N, 30° 50′ W, surface, 14—5—1908, 3 spec.
(St. 303) 59° 28′ N, 33° 05′ W, surface, 26—4—1909, 1 spec.
(St. 1 a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, 2 spec.
(St. 321) 60° 07′ N, 48° 26′ W, 600 m. wire, 3—5—1909, 10 spec.
(St. 322) — — 2000 m. wire, — 7 spec.
(St. 302) 60° 10′ N, 28° 13′ W, surface, 25—4—1909, ca. 20 spec.

24. **Thysanoessa inermis** Kr.

= **Rhoda inermis** Kr. + **Thysanoessa neglecta** Kr.

(See H. J. Hansen, The genera and species of the order Euphausiacea, with account of remarkable variation. Bull. Inst. Océanogr., Monaco, No. 210, 1911, p. 8—13, 38).

A. Forma **Rhoda inermis**.

Thysanopoda inermis Kröyer in Gaimard, Voyage en Scand., Crust. 1846 (1849?). Pl. 7, fig. 2.
**Euphausia* — G. O. Sars, Forh. Vid. Selsk. Christiania 1882, No. 18, p. 9, 51, Pl. 1, fig. 15.
Boreophausia — G. O. Sars, Norske Nordhavs-Exp., Crust.. 1886, p. 13.
Rhoda — Stebbing, Ann. Mag. Nat. Hist., ser. 7, vol. 5, 1900, p. 10.
— — Zimmer, Fauna arctica, vol. 3, 1904, p. 420.
— — H. J. Hansen, "Ingolf" 1908, p. 86.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 11. fig. 11—12.
Boreophausia — H. J. Hansen, V. Grönland 1887, p. 53.

(St. 423) 65° 03′ N, 54° 16′ W, 120, 100 and 80 m. wire, 7—6—1909, 1 spec.

B. Forma Thysanoessa neglecta Kr.

Thysanopoda neglecta Kröyer, in Gaimard: Voyage en Scand., Crust., 1846 (1849?) Pl. 7, fig. 3.
**Thysanoessa borealis* G. O. Sars, Forh. Vid. Selsk., Christiania 1882, No. 18, p. 9, 52 Pl. 1, fig. 16—18.
— *neglecta* Zimmer, Fauna arctica, vol. 3, 1904, p. 423.
— — H. J. Hansen, "Ingolf" 1908, p. 89.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 19, fig. 28—29.
— — H. J. Hansen, V. Grønland 1887, p. 54.

(St. 9) 58° 33′ N, 35° 55′ W, 600 m. wire, 17—5—1908, 1 spec.

25. **Thysanoessa longicaudata** Kr.

Thysanopoda longicaudata Krøyer, in Gaimard: Voyage en Scandinavie, Crust., 1846 (1849?), Pl. 8, fig. 1.
* *Thysanoessa tenera* G. O. Sars, Forh. Vid. Selsk. Christiania 1882, No. 18, p. 9, 53, Pl. 1, fig. 19—20.
— *longicaudata* Zimmer, Fauna arctica, vol. 3, 1904, p. 424.
* — — Holt & Tattersall, Rep. Sea and Inland Fisheries. Ireland, 1902—03 (1905), pt. 2, App. No. 2, p. 107, 138, Pl. 15.
— — H. J. Hansen, "Ingolf" 1908, p. 88.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 20, fig. 30—31.
— — H. J. Hansen, V. Grønland 1887, p. 54.

(St. 11) 57° 41′ N, 35° 28′ W, surface, 20—5—1908, 2 spec.
(St. 281) 57° 51′ N, 43° 57′ W. 500 m. wire, 29—9—1908, 15 spec.
(St. 285) 57° 51′ N, 43° 48′ W, 1000 m. wire, 29—9—1908, 15 spec.
(St. 286) 57° 59′ N, 41° 21′ W, 80—200 m. wire, 30—9—1908, ca. 35 spec.
(St. 23) 58° 01′ N, 51° 36′ W, surface, 1—6—1908, 3 spec.
(St. 13) 58° 08′ N, 39° 10′ W. 40 m. wire, 26—5—1908, many spec. (ca. 30 cm.^{3}).
(St. 15) 53° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, many spec. (ca. 150 cm.^{3}).
(St. 278) 58° 16′ N, 47° 12′ W, 200—80 m. wire, 28—9—1908, 20 spec.
(St. 308) 58° 20′ N, 41° 12′ W, 1000 m. wire, 28—4—1909, 20 spec.
(St. 5) 58° 23′ N, 34° 41′ W, surface, 16—5—1908, 2 spec.
(St. 6) 58° 24′ N, 34° 53′ W, surface, 16—5—1908, 10 spec.
(St. 292) 58° 24′ N, 30° 35′ W, 500 m. wire, 3—10—1908, many spec. (ca. 4 cm.^{3}).
(St. 7) 58° 33′ N, 35° 49′ W, 150 m. wire, 17—5—1908, ca. 100 cm.^{3}
(St. 9) 58° 33′ N, 35° 55′ W, 600 m. wire, 17—5—1908, ca. 100 cm.^{3}
(St. 313) 58° 38′ N, 46° 13′ W, surface, 29—4—1909, ca. 35 spec.

(St. 2) 58° 40′ N, 30° 40′ W, surface, 14—5— 1908, ca. 35 spec.
(St. 19a) 58° 41 N, 49° 44′ W, 100 m. wire, 31—5—1908, 15 spec.
(St. 19b) — — 200 m. wire, — 15 spec.
(St. 316) 58° 59′ N, 50° 28′ W, 500 m. wire, 1—5—1909, 35 spec.
(St. 276) 59° 18′ N, 51° 00′ W, 80 m. wire, 27—9—1908, 15 spec.
(St. 1 a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, many sp. (30 cm.^{3}).
(St. 1 b) — — surface, — many sp. (5 cm.^{3}).
(St. 298) 59° 41′ N, 25° 02′ W, 500 m. wire, 6—10—1908, 1 spec.
(St. 321) 60° 07′ N, 48° 26′ W, 600 m. wire, 3—5—1909, many sp. (50 cm.^{3}).
(St. 322) — — 2000 m. wire, — many sp. (15 cm.^{3}).
(St. 326) 62° 05′ N, 53° 41′ W, 100 m. wire, 6—5—1909, many sp. (15 cm.^{3}).
(St. 270) 62° 21′ N, 51° 31′ W, 84 fath., 80 m. wire, 24—9—1908, 10 spec.
(St. 329) 62° 36′ N, 54° 12′ W, pelagic townet, 6—5—1909, 3 spec.
(St 330) — — surface, 6—5—1909, many spec. (30 cm.^{3}).
(St. 30 a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, many sp. (10 cm.^{3}).
(St. 30 b) — — 70 m. wire, — many sp. (100 cm.^{3}).
(St. 433) 63° 05′ N, 54° 21′ W, 80—120 m. wire, 9—6—1909, 20 spec.
(St. 31 a & c) 63° 11′ N, 56° 23′ W, pelagic townet, 7—6—1908, 40 spec.
(St. 33 b) 63° 25′ N, 54° 34′ W, 200 m. wire, 8—6—1908, many (3 cm.^{3}).
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m. 1000 wire, 23—6—1908, 3 spec.
(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909, 1 spec.
(St. 405) 64° 25′ N, 56° 12′ W, 100 m. wire, 2—6—1909, many (3 cm.^{3}).
(St. 42) 65° 03′ N, 54° 16′ W, 80, 100, 120 m. wire, 7—6—1909, many (4 cm.^{3}).
(St. 196 d) 68° 40′ N, 53° 12′ W, 350 m.wire, 17—8—1908 many spec. (4 cm.^{3}).

26. **Rhoda Raschii** M. Sars.

Thysanopoda Raschii M. Sars, Forh. Vid. Selsk. Christiania, 1863, p. 83.
**Euphausia* — G. O. Sars, ibid. 1882, No. 18, p. 9, 51.
Boreophausia — Norman, Rep. Fish. Board Scotl., vol. 4, 1886, p. 156.
Rhoda — Zimmer, Fauna arctica vol. 3, 1904, p. 421.
— — H. J. Hansen, "Ingolf" 1908, p. 87.
**Boreophausia* — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 11 (fig.).
Thysanopoda — Vanhöffen, 1897. vol. 2. Pl. 1, fig. 1, p. 381 (nomen nudum) (coloured fig.)
Boreophausia — H. J. Hansen, V. Grønland 1887, p. 53.

(St. 11) 57° 41′ N, 35° 28′ W, surface 20—5—1908, 1 spec.
(St. 297) 59° 10′ N, 27° 44′ W, pelagic townet, 4—10—1908, 3 spec.
(St. 329) 62° 36′ N, 54° 12′ W, pelagic townet, 6— —1909, 1 spec.
(St. 30 a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, 1 spec.
(St. 341) 64° 34′ N, 53° 20′ W, 200 m. wire, 9—5—1909, 0a. 50 spec.
(St. 196 d) 68° 40′ N, 53° 12′ W, 350 m. wire, 17—8—1908, 4 spec.
Tassiusak at Egedesminde, from the stomach of Gadus ogac, 12—8—1908, many spec. (40 ccm.)
(St. 171) 70° 41′ N, 52° 07′ W, 386 fath., 800 m. wire, 6—8—1008, 1 spec.
(St. 172) 70° 42′ N, 52° 14′ W, 450 m. wire, 6—8—1098, 8 spec.

27. **Nematoscelis megalops** G. O. Sars.

Nematoscelis megalops G. O. Sars, Forh. Vid. Selsk. Christiania for 1883, No. 7, p. 27.
* — — — Challenger Report, vol. 13, pt. 37, p. 127, Pl. 23, fig. 5—10, Pl. 24.
— — H. J. Hansen, Bull. Mus. Océanogr., Monaco, No. 30, 1905, p. 27.
— — Zimmer, Fauna arctica, vol. 3, 1904, p. 425.
— — H. J. Hansen, "Ingolf" 1808, p. 90.
— — — Siboga-Schizop., 1910, p 106.

(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, 3 spec.
(St. 9) 58° 33′ N, 35° 55′ W, 600 m. wire, 17—5—1908, 1 spec.
(St. 1a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, 9 spec. (2 ♀♀ with ova).

As recorded above 2 of the specimens from St. 1 a carry their ova. In "On propagation and early development of Euphausiidæ" in "Archiv for Mathematik og Naturvidenskab", vol. 20, 1898, No. 11, p. 9, G. O. Sars mentions but 4 species carrying their ovisacs, viz. *Nyctiphanes Couchii* (see also Holt & Tattersall, Schizop. from the N. E. Atlantic Slope, Ann. Rep. Fish. Ireland, 1902—03, No. 4 (1905) p. 104, Pl. 17, fig. 2), *N. australis*, *Nematoscelis microps* and *Stylecheiron carinatum*. Sars says "it is .... very probable, that these cases are quite exceptional, and that in the far greater number of Euphausiidæ the ova are at once ejected into the water". I have from the literature not been able to find later additions to Sars' list.

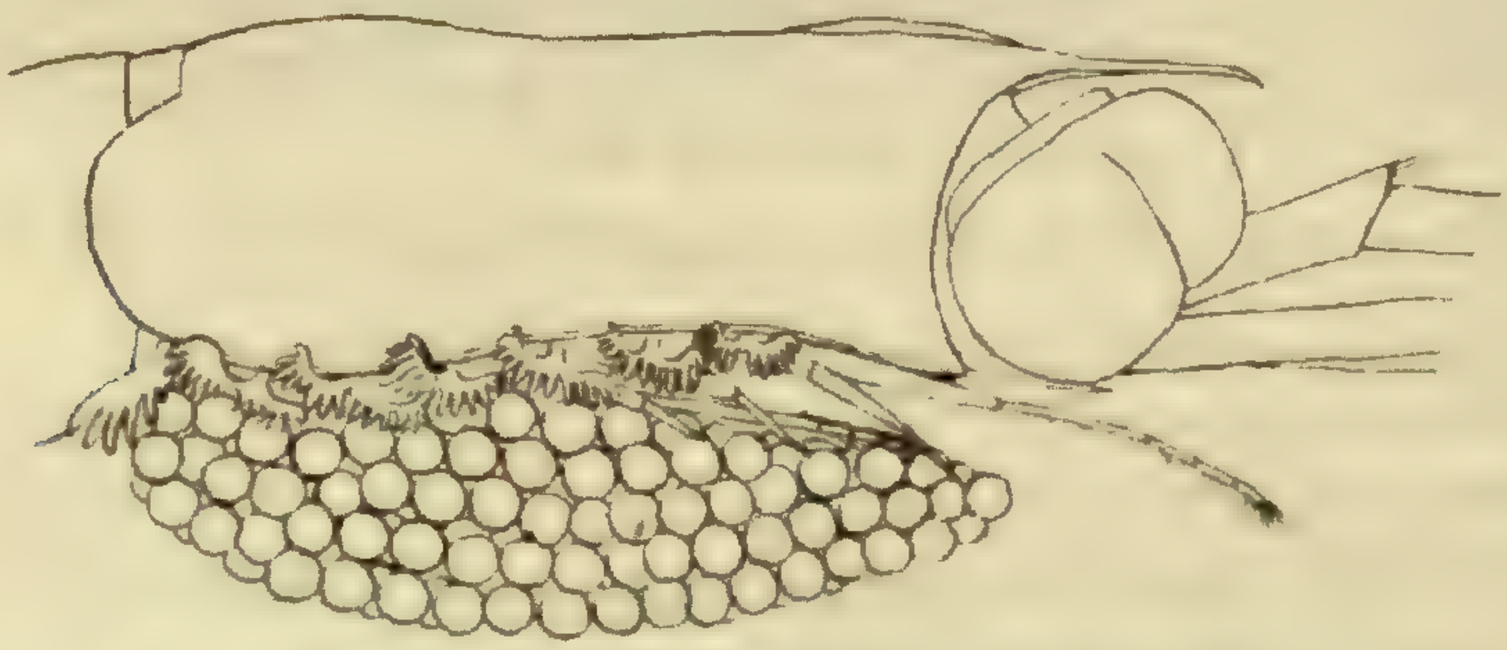


Fig. 2. *Nematoscelis megalops* with ovisac.

Nematoscelis megalops carries, as is shown by the figure (fig. 2), its ova in an ovisac pointed in front; seen from below it seems to be

composed of two parallel ovisacs and has about the same form as from the side, and it has about the same length as the carapace. The ova are (in alcohol) yellow, the diameter is 0,45 mm.

Mysidacea

28. **Gnathophausia zoea** Will.-Suhm.

Gnathophausia zoea Willemoes-Suhm, Nature, vol. 8, 1873, p. 401 fig. 1.
— — — Transact. Linn. Soc., ser. 2, vol. 1, 1875, p. 32, Pl. 9, fig. 2—15.
* — — G. O. Sars, Challenger Report, Zool., vol. 13, pt 37, 1885, p. 44, Pl. 6, fig. 6—10.
* — *Willemoesii* G. O. Sars, ibid., p. 38, Pl. 5, fig. 1—6.
— *zoea* Zimmer, Nordisches Plankton, vol. 6, 1909, p. 34. (with figs).
— — H. J. Hansen., "Ingolf" 1908, p. 93.
— — — Siboga-Schizop., 1910, p. 17.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 2 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909, 12 spec.
(St. 32) 63° 16′ N, 55° 52′ W, surface, (at night) 8—6—1908, 1 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1530 m. wire, 7—5—1909, 5 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m. 1000 m. wire, 23—6—1908, 9 spec.
(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909, 7 spec.
(St. 344) 64° 22′ N, 55° 48′ W, 1040 m., 1200 m. wire, 10—5—1909, 4 spec.

The largest specimen is from St. 322 and is 70 mm. exclusive of the rostrum (which is broken). In "Ingolf" H. J. Hansen mentions the species from 9 localities; but he has from no station more than 1 specimen.

29. **Eucopia unguiculata** Will.-Suhm.

Charalaspis unguiculata Willemoes-Suhm, Transact. Linn. Soc., ser. 2, vol. 1. 1875, p. 37, Pl. 8.
(partim) *Eucopia australis* G. O. Sars, Challenger Report, Zool., vol. 13, pt. 37, 1885, p. 55, Pl. 9—10.
* — *unguiculata* H. J. Hansen, Bull. Mus. Monaco, No. 42, 1905, p. 3.
— — — "Ingolf" 1908, p. 95.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 37, fig. 59—60.
— — H. J. Hansen, Siboga-Schizop, 1910, p. 20.

non *Eucopia australis* Dana, U. S. Expl. Exp., Crust., vol. 1, 1852, p. 609, p. 40, fig. 10 (teste Zimmer, l. c.)

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 5 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1909, ca. 25 spec.
(St. 336) 64° 06″ N, 55° 18′ W, 1040—1000 m., 1200 m. wire, 8—5—1909, 6 spec.

In "Ingolf" H. J. Hansen mentions but a single specimen from the Davis-Straits (61° 50′ N, 56° 21′ W, 1435 fm.).

30. **Boreomysis tridens** G. O. Sars.

Boreomysis tridens G. O. Sars, Vid. Selsk. Forh., Christiania, 1869 (1870), p. 153.
* — — — Monografi Norges Mysider, III, 1879, p. 17, Pl. 14.
— — H. J. Hansen, "Ingolf" 1908, p. 100.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 59, fig. 91—94.

(St. 402) 64° 40′ N, 56° 37′ W, 720—775 m., trawl, 2—6—1909, 10 spec.

32. **Boreomysis nobilis** G. O. Sars.

Boreomysis nobilis G. O. Sars, Archiv f. Math. og Naturv., vol. 4, 1879, p. 428.
**Boreomysis nobilis* G. O. Sars, Norske Nordhavs-Exp., Crust., 1885, p. 54, Pl. 5, fig. 22-28.
— — Ohlin, 1901, p. 70, fig. 3.
— — Zimmer, Fauna arctica, vol. 9, 1904, p. 432.
— — H. J. Hansen, Ingolf 1908, p. 101.
— — Zimmer, Nordisches Plankton, vol. 6, 1909, p. 56, fig. 83—86.
— — H. J. Hansen, V. Grønland 1887, p. 214.

(St. 431) 63° 24′ N, 53° 10′ W, 892 m, trawl, 9—6—1909, 2 spec.
(St. 337) 64° 05′ N, 52° 20′ W, 1100 m., trawl, 8—5—1909, 1 spec.
(St. 407—08) 64° 14′ N, 55° 55′ W, 839 m, clay, trawl, 2—6—1909, 10 spec.
(St. 125) 69° 17′ N, 52° 14′ W, 550 m wire, 16—7—1908, many spec. (100 cm^3).
(St. 171) 70° 41′ N, 52° 07′ W, 386 fath., 800 m wire, 6—8—1908, many spec. (100 cm^3).

32. **Boreomysis microps** G. O. Sars.

Boreomysis microps G. O. Sars, Forh. Vid. Selsk. Christiania for 1883. No. 7, p. 35.

**Boreomysis nobilis* G. O. Sars, Challenger-Report, Zool., vol. 13, pt. 37. 1885, p. 185, Pl. 33, fig. 7—10.
— *subpellucida* H. J. Hansen, Bull. Mus. Océanogr., Monaco, No. 30, 1905, p. 8, fig. 5—8.
— *microps*, Zimmer, Fauna arctica, vol. 3, 1904, p. 431.
— — — Nordisches Plankton. vol. 6, 1909, p. 55, fig. 79—82.
— — H. J. Hansen, Ingolf 1908. p. 103.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 7 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909, 10 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1909, 20 spec.
(St. 338) 64° 01′ N, 55° 30′ W. 1185 m., 1400—1500 m. wire, 8—5—1909, 20 spec.
(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire. 8—5—1909. 25 spec.
(St. 346) 64° 22′ N, 56° 00′ W, 800—400 m. wire, 10—5—1909, 25 spec.
(St. 348) 64° 35′ N, 56° 18′ W, 900 m. wire, 11—5—1909, ca. 20 spec.

New to W. Greenland.

33. **Longithorax fuscus** H. J. Hansen.

**Longithorax fuscus* H. J. Hansen, Ingolf 1908, p. 103, Pl. 5, fig. 1.
— — Zimmer, Nordisches Plankton vol. 6, 1909, p. 125. fig. 240—43.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909. 1 spec. (♀,17 mm., very imperfect).

New to Greenland. — Only 4 specimens of this species are known, viz, besides the specimen from the "Tjalfe", 3 from the following localities: 61° 30' N, 17° 08' W, 1800 m. wire (S. of Iceland) (H. J. Hansen "Ingolf"), 49° 27' N, 13° 33' W, 2600 m., 2800 m. wire (H. J. Hansen, ibid.), and 50° 59' W, 11° 52' W, 900—1064 fms., temp. 15,4° C. (W. of Ireland) (Tattersall, Fisheries, Ireland, Sci. Invest., 1911 p. 52).

34. **Meterythrops robusta** S. I. Smith.

Meterythrops robusta S. I. Smith, Transact. Conn. Acad, vol. 5, 1879, p. 93, Pl. 12, fig. 1—2.
**Parerythrops* — G. O. Sars, Monografi Norges Mysider, III, 1879, p. 98, Pl. 39.
— — Zimmer, Fauna arctica, vol. 3, 1904, p. 445.

Meterythrops robusta Zimmer, Nordisches Plankton. vol. 6, 1909, p. 85, fig. 168—72.
— — — H. J. Hansen, Ingolf 1908, p. 106.
non — — — Holt & Tattersall, Rep. Sea and Inland Fisheries, 1902—03 (1903), pt. 2, App. No. 4 (is *Parerythrops obesa*, see H. J. Hansen l. c., p. 107, ***Meterythrops robusta***).

(St. 196 d) 68° 40′ N, 53° 12′ W, 410 m., 350 m. wire, 17—8—1908, 1 spec.

35. **Mysis oculata** O. Fabr.

Cancer oculatus O. Fabricius, Fauna Groenlandica, 1780, p. 245.
— — — Kgl. Danske Vid. Selsk. Skrifter, Ny Samling, vol. 1, 1781, p. 565, fig. 2.
Mysis oculata Krøyer in Gaimard, Voyage en Scandinavie, Crust., 1846 (1849?) Pl. 8, fig. 2—3.
— — — Naturhist., Tidsskrift, 3. Række, vol. 1, 1861, p. 13.
* — — G. O. Sars, Monografi Norges Mysider, III, 1879, p. 69, Pl. 31.
— — Zimmer, Fauna arctica, vol. 3, 1904, p. 461.
— — — Nordisches Plankton, vol. 6, 1909, p. 160, fig. 348—54.
— — H. J. Hansen, Ingolf, 1908, p. 114.
— — — V. Grønland 1887, p. 214.

Vaskebugten close by Ritenbenk, from the stomach of Gadus callarias, 29—7—1908, many spec. (ca. 15 cm.³).

Cumacea.

36. **Diastylis Goodsirii Bell.**

Alauna Goodsirii Bell, in Belcher, Last of the arctic voyages, vol. 2, 1855, p. 403, Pl. 34, fig. 2.
**Diastylis* — H. J. Hansen, Dijmphna—Togtets zool.-botan. Udbytte, 1887, p. 241, Pl. 22, fig. 5, Pl. 23, fig. 1.
— — Zimmer, Fauna arctica, vol. 1, 1900, p. 422.
* — — G. O. Sars, Account, vol. 3, Cumac., 1900, p. 54, Pl. 41.
— — H. J. Hansen, V. Grønland 1887, p. 206.

(St. 369) 66° 45′ N, 56° 30′ W, ca. 200 fath., trawl, 20—5—1909, ca. 20 spec.

37. **Diastylis spinulosa** Heller.

Diastylis spinulosa Heller, Denkschr. d. K. Akad. d. Wiss., Wien, Math. naturwiss. Cl., vol. 35, 1878, p. 28, Pl. 1, fig. 5.
— — Hoeck, Niederl. Arch. f. Zool., Supplbd. 1, 1882, p. 25.
— *nodosa* G. O. Sars, Norske Nordhavs-Exp., Crust. 1885, p. 61, Pl. 7, fig. 1—4.

**Diastylis spinulosa* G. O. Sars, Account vol. 3, Cumac., 1900, p. 55, Pl. 42.
— — Zimmer, Fauna arctica vol. 1, 1900, p. 225.
— — H. J. Hansen, V. Grønland 1887, p. 205.

(St. 369) 66° 45′ N, 56° 30′ W, ca. 200 fath., trawl, 20—5—1909, 4 spec.

Amphipoda.

38. **Scina sp.**

(St. 338) 64° 01′ N, 55° 30′ W, 1185 m., 1400—1500 m. wire, 8—5—1909, 1 spec., very imperfect.

The genus is new to Greenland.

Genus Lanceola.

Key to the species: Stebbing in Biscayan Plankton, part 2, Amphip. & Cladocera, Transact. Linn. Soc., London, 1904, ser. 2, Zool., vol. 10, part. 2, p. 29.

39. **Lanceola serrata** Bovallius.

Lanceola serrata Bovallius. On some forgotten genera among Amphip. Crust., Bihang Kgl. Svenska Vet. Akad. Handl. vol. 10, 1885, No. 14, p. 7.
— — — Arctic and Antarctic Hyperids, Vega-Expeditionens vet. Iaktt., vol. 4, 1887, p. 554.
* — — — Amphip. Hyper, part I, 1. Kgl. Svenska Vet. Akad. Handl., vol. 21, 1887, No. 5, p. 34, Pl 5, fig. 2—13.

(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1909, 1 spec.
(St. 344) 64° 22′ N, 55° 48′ W, 1040 m., 1200 m. wire, 10—5—1909, 1 spec.

? 40. **Lanceola Sayana** Bovallius.

Lanceola Sayana Bovallius, On some forgotten genera among the Amph. Crust., Bihang Kgl. Svenska Vet. Akad. Handl., vol. 10, 1885, No. 14, p. 7, Pl. 1, fig. 1.
* — — Bovallius, Kgl. Svenska Vet. Akad. Handl., vol. 21, No. 5, 1887, p. 30, Pl. 4, Pl. 5, fig. 1.
— — Chevreux, Amphip. de l'»Hirondelle«, Rés. Camp. Sci. fasc. 16, Monaco, 1900, p. 134, Pl. 14, fig. 10 (Coloured fig.).
— — Vosseler, Amphip. d. Plankton-Exp. I, Hyperiiden 1. Mitt. Kønigl. Natur-Kabinet, Stuttgart, No. 17, 1901, p. 127.

Lanceola sayana Stebbing, Biscayan Plankton, Amphip. and Cladoc. Transact. Linn. Soc. London, Zool., vol. 10, pt. 2, 1904, p. 29—30.

(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909. 1 spec.

I am not quite sure that the determination is right, the specimen being somewhat imperfect; but, if it is, as I believe, *L. Sayana*, the species is new to Greenland.

Lanceola sp.

(St. 1b) 59° 25′ N, 22° 56′ W, surflace, 12—5—1908, 2 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909. 1 spec.

I have not been able to determine these 3 specimens, partly because they seem to me to be not full-grown, partly because they are somewhat imperfect.

41. **Hyperia medusarum** O. Fr. Müller.

Cancer medusarum O. Fr. Müller, Zool. Dan. Prodromus, 1776, No. 2355, p. 196.
Hyperia spinipes Boeck, Skandinav. og Arkt. Amphip, 1873—76, p. 81, Pl. 2, fig. 2.
— *medusarum* Bovallius, Arctic and Antarctic Hyperids, Vega-Expeditionens vetenskap. Iaktt. vol. 4, 1887, p. 560, Pl. 42, fig. 26—33.
* — — G. O. Sars, Account, vol. 1, Amphip., 1895, p. 7, Pl. 3, fig. 2.
— — H. J. Hansen, V. Grønland 1887, p. 86.

(St. 11) 57° 41′ N, 35° 28′ W, surflace, 20—5—1908, 2 spec.
(St. 285) 57° 51′ N, 43° 48′ W, 1000 m. wire, 29—9—1908, 1 spec.
(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, 3 spec.
(St. 6) 58° 24′ N, 34° 53′ W, surflace, 16—5—1908, 3 spec.
(St. 312) 58° 38′ N. 46° 13′ W, pelagic townet, 29—4—1909, 1 spec.
(St. 313) — — surflace — 1 spec.
(St. 9) 58° 33′ N, 35° 55′ W, 600 m. wire, 17—5—1908, 5 spec.
(St. 19b) 58° 41′ N, 49° 44′ W, 200 m. wire, 31—5—1908, 1 spec.
(St. 1a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, 3 spec.
(St. 1b) — — surflace — 2 spec.
(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 1 spec.
(St. 270) 62° 21′ N, 51° 31′ W, 84 fath., 80 m. wire, 24—9—1908, 1 spec.
(St. 329) 62° 36′ N, 54° 12′ W, pelagic townet, 6—5—1909, 4 spec.

(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1500—1200 m. wire, 9—6—1909, 1 spec.
(St. 423) 65° 03′ N, 54° 16′ W, 80, 100, 120 m. wire, 7—6—1909, 1 spec.
(St. 30a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, 4 spec.
(St. 30b) — — 70 m. wire — 1 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1000 m. wire, 23—6—1908, 1 spec.

From the literature we cannot see, if the species hitherto has been taken at W. Greenland; in V. Grønland 1887 H. J. Hansen mentions it from Greenland without special locality, and Bovallius (l. c.) mentions it but from "coasts of Greenland".

42. **Hyperoche Krøyeri** Bovallius.

Metoecus Medusarum Krøyer, Grønlands Amfipoder, Kgl. Danske Vid. Selsk. math.-naturvid. Afhandl., vol. 7, 1838, p. 288, Pl. 3, fig. 15.
Tauria — Boeck, Skand. og Arktiske Amphipoder, 1873—76, p. 82.
Hyperoche Krøyeri + *H. Liitkenii* Bovallius, Arct. and Antarct. Hyperids, Vega-Expeditionens vet. Iaktt., vol. 4, 1887, p. 564, p. 565, Pl. 44, fig. 63-71.
* — *Krøyeri* G. O. Sars, Account, vol. 1, Amphip, 1895, p. 9, Pl. 4.
— *medusarum* H. J. Hansen, V. Grønland 1887, p. 58.

(St. 11) 57° 41′ N, 35° 28′ W, surflace, 20—5—1908, 2 spec.
(St. 23) 58° 01′ N, 51° 36′ W, surflace, 1—6—1908, 1 spec.
(St. 6) 58° 24′ N, 34° 53′ W, surflace, 16—5—1908, 3 spec.
(St. 292) 58° 24′ N, 30° 35′ W, 500 m. wire, 3—10—1908, 3 spec.
(St. 7) 58° 33′ N, 35° 49′ W, 150 m. wire, 17—5—1908, 1 spec.
(St. 1b) 59° 25′ N, 22° 56′ W, surflace, 12—5—1908, 9 spec.
(St. 270) 62° 21′ N, 51° 31′ W, 84 fath, 80 m. wire, 24—9—1908, 2 spec.
(St. 229) 64° 20′ N, 53° 03′ W, 80—120 m. wire, 29—8—1908, 7 spec.
(St. 405) 64° 25′ N, 56° 12′ W, 100 m. wire, 2—6—1909, 1 spec.

43. **Parathemisto oblivia** Kr.

Hyperia oblivia Krøyer, Grønlands Amfipoder, Kgl. Danske Vid. Selsk. naturvid.-math. Afh., vol. 7, 1838, p. 296, Pl. 4, fig. 10.
Parathemisto abyssorum Boeck, Crust. Amphip. boreal. et arct., Vid. Selsk. Forh. Christiania, 1870, p. 86.
— *oblivia* G. O. Sars, Oversigt af Norges Crust., ibid., 1882, Nr. 18, p. 10, Pl. 5, fig. 1.
**Parathemisto oblivia* G. O. Sars, Account, vol. 1, Amphip., 1895, p. 10, Pl. 5, fig. 1.
— *abyssorum* + *Hyperia Latreillei* (partim) H. J. Hansen, V. Grønland 1887, p. 59, 56.

(St. 10) 57° 37′ N, 35° 17′ W, surflace, 20—5—1908, 3 spec.
(St. 321) 60° 07′ N, 48° 26′ W, 600 m. wire, 3—5—1909, 1 spec.
(St. 30a) 63° 04 N, 56° 32′ W, 500 m. wire, 7—6—1908, 1 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m., 1000 m. wire, 23—6—1908, 1 spec.
(St. 196d) 68° 40′ N, 53° 12′ W, 410 m., 350 m. wire, 17—8—1908, 1 spec.
(St. 125) 69° 17′ N, 52° 14′ W, 550 m. wire, 16—7 -190 many spec. (5 cm.³)
(St. 171) 70° 41′ N, 52° 07′ W, 386 fath., 800 m. wire, 6—8—1908, 15 spec.
(St. 172) 70° 42′ N, 52° 14′ W. 450 m.wire, 6—8—1908, many spec. (5 cm.³).

44. **Euthemisto compressa** Goës.

Themisto compressa Goës, Crust. Amphip. Spetsberg., Kgl. Svenska Vet. Akad. Forh., 1866, No. 8, p. 533, Pl.41, fig. 34.
Parathemisto — Boeck, Crust. Amphip. boreal. et arctca, Vid. Selsk., Forh., Christiania 1870, p. 7.
**Euthemisto* — G. O. Sars, Account, vol. 1, Amphip., 1895, p. 12, Pl. 5, fig. 2.
(partim) — — H. J. Hansen, V. Grønland 1887, p. 59 (confounded with *E. bispinosa* Boeck).

(St. 10) 57° 37′ N, 35° 17′ W, surflace, 20—5—1908, 10 spec.
(St. 11) 57° 41′ N, 35° 28′ W, surflace, 20—5—1908, manyspec. (25 cm.³).
(St. 281) 57° 51′ N, 43° 57′ W, 500 m. wire, 29—9—1908, many spec. (20 cm.³).
(St. 285) 57° 51′ N, 43 48′ W, 1000 m. wire, 29—9—1908, many spec. (25 cm.³)
(St. 286) 57° 59′ N, 41° 21′ W, 80—200 m. wire, 30—9—1908, many spec. (25 cm.³).
(St. 23) 58° 01′ N, 51° 36′ W, surflacc, 1—6—1908, 9 spec.
(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, many spec. (25 cm.³)
(St. 278) 58° 16′ N, 47° 12′ W, 80—200 m. wire, 28—9—1908, many spec (10 cm.³).
(St. 308) 58° 20′ N, 41° 12′ W, 1000 m. wire, 28—4—1909, 8 spec.
(St. 5) 58° 23′ N, 34° 41′ W, surflace, 16—5—1908, 10 spec.
(St. 6) 58° 24′ N, 34° 53′ W, surflace, 16—5—1908, many spec. (20 cm.³).
(St. 292) 58° 24′ N, 30° 35′ W, 500 m. wire, 3—10—1908, many spec. (5 cm.³).
(St. 4) 58° 27′ N, 33° 03′ W, surflace, 15—5—1908, 10 spec.
(St. 25) 58° 32′ N, 51° 11′ W, surflace, 2—6—1908, 1 spec.
(St. 9) 58° 33′ N, 35° 55′ W, 600 m. wire, 17—5—1908, , spec.
(St. 312) 58° 38′ N, 46° 13′ W, pelagic townet, 29—4—1909 1 spec.
(St. 313) — — surflace, — 3 spec.
(St. 2) 58° 40′ N, 30° 40′ W, surflace, 14—5—1908, many spec. (10 cm.³).
(St. 19b) 58° 41′ N, 49° 44′ W, 200 m. wire, 31—5—1908. 2 spec.
(St. 316) 58° 59′ N, 50° 28′ W, 500 m. wire, 1—5—1909, many spec. (5 cm.³).

(St. 1a) 59° 25′ N, 22° 56′ W, 175 m. wire, 12—5—1908, many spec. (10 cm.³).
(St. 1b) — — surflace, — — —
(St. 303) 59° 28′ N, 33° 05′ W, pelagic townet, 26—4—1909, 8 spec.
(St. 298) 59° 41′ N, 25° 02′ W, 500 m. wire, 6—10—1908, 3 spec.
(St. 321) 60° 07′ N, 48° 26′ W, 600 m. wire, 3—5—1909, 15 spec.
(St. 322) — — 2000 m. wire, — 2 spec.
(St. 301) 60° 10′ N, 28° 13′ W, pelagic townet, 25—4—1909, 3 spec.
(St. 326) 62° 05′ N, 53° 41′ W, 100 m. wire, 6—5—1909, 2 spec.
(St. 329) 62° 36′ N, 54° 12′ W, pelagic townet, 6—5—1909, 12 spec.
(St. 330) — — surflace, — 2 spec.
(St. 29) 62° 45′ N, 57° 11′ W, surflace, 7—6—1908, 2 spec.
(St. 30a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, many spec. (25 cm.³).
(St. 30b) — — 70 m. wire, — — —
(St. 31a) 63° 11′ N, 56° 23′ W, pelagic townet, 7—6—1908, 1 spec.
(St. 33b) 63° 25′ N, 54° 34′ W, 200 m. wire, 8—6—1908, 6 spec.
(St. 37b) 63° 47′ N, 52° 12′ W, 100 m. wire, 9—6—1908, 1 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1000 m. wire, 23—6—1908, 7 spec.
(St. 229) 64° 20′ N, 53° 03′ W, 80—120 m. wire, 29—8—1908, many spec. (10 cm.³).
(St. 423) 65° 03′ N, 54° 16 W, 80, 100, 120 m. wire, 7—6—1909, 1 spec.

45. **Euthemisto bispinosa** Boeck.

Themisto bispinosa Boeck, Crust. Amphip. boreal. et arctica, Vid. Selsk. Forh., Christiania, 1870, p. 8.
**Euthemisto* — G. O. Sars, Account, vol. 2, Amphip., 1895, p. 14, Pl. 6, fig. 2.
(partim) — *compressa* H. J. Hansen, V. Grønland 1887, p. 59 (*E. bispinosa* Boeck and *E. compressa* Goës are confounded).

(St. 23) 58° 01′ N, 51° 36′ W, surflace, 1—6—1908, many spec. (12 cm.³).
(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, many spec. (7 cm.³).
(St. 278) 58° 16′ N, 47° 12′ W, 80—200 m. wire, 28—9—1908, 2 spec.
(St. 308) 58° 20′ N, 41° 12′ W, 1000 m. wire, 28—4—1909, 2 spec.
(St. 25) 58° 32′ N, 51° 11′ W, surflace, 2—6—1908, 5 spec.
(St. 313) 58° 38′ N, 46° 13′ W, 29—4—1909, 6 spec.
(St. 19a) 58° 41′ N, 49° 44′ W, 100 m. wire, 31—5—1908, 4 spec.
(St. 19b) — — 200 m. wire, — —
(St. 316) 58° 59′ N, 50° 28′ W, 500 m. wire, 1—5—1909, 9 spec.
(St. 276) 59° 18′ N, 51° 00′ W, 80 m. wire, 27—9—1908, many spec. (15 cm.³).
(St. 298) 59° 41′ N, 25° 02′ W, 500 m. wire, 6—10—1908, 3 spec.
(St. 270) 62° 21′ N, 51° 31′ W, 84 fath., 80 m. wire, 24—9—1908, many spec. (5 cm.³).

(St. 329) 62° 36′ N, 54° 12′ W, pelagic townet, 6—5—1909, 3 spec.
(St. 330) 62° 36′ N, 54° 12′ W, surflace, 6—5—1909, 3 spec.
(St. 29) 62° 45′ N, 57° 11′ W, surflace, 7—6—1908, 10 spec.
(St. 30a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, many spec. (30 cm.^{3}).
(St. 30b) — — 70 m. wire, — 2 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m., 1000 m. wire, 23—6—1908, 1 spec.
(St. 229) 64° 20′ N, 53° 03′ W, 80—120 m. wire, 29—8—1908, 8 spec.

46. **Euthemisto libellula** Mandt.

Gammarus Libellula Mandt, Observat. in hist. nat. et anat. compar. in itinere Groenl. factæ, 1822, p. 32.
Themisto arctica + *T. crassicornis* Krøyer, Grønlands Amfipoder, Kgl. Danske Vid. Selsk. naturv. math. Afh., vol. 7, 1838. p. 291, Pl. 4, fig. 16, p. 295, Pl. 4, fig. 17.
— *libellula* Boeck, Skand. og Arkt. Amphip., 1873—76, p. 88.
Euthemisto — + *E. Nordenskiöldii* Bovallius, Arct. and. Antarct. Hyp., Vega Exp. vet. Iaktt., vol. 4, 1887, p. 569, Pl. 46, fig. 90—96, p. 570, Pl. 47, fig. 104—10.
* — — G. O. Sars, Account, vol. 1, Amphip., 1895, p. 13, Pl. 6, fig. 1.
— — H. J. Hansen, V. Grønland 1887, p. 60.

(St. 25) 59° 32′ N, 51° 11′ W, surflace, 2—6—1908, 5 spec.
(St. 7) 58° 33′ N, 35° 49′ W, 150 m. wire, 17—5—1908, 1 spec.
(St. 312) 58° 38′ N, 46° 13′ W, pelagic townet, 29—4—1909, 1 spec.
(St. 321) 60° 07′ N, 48° 26′ W, 600 m. wire, 3—5—1909, 2 spec.
The channel at Nanortalik, from stomachs of Gadus, 6—9—1909, 7 spec.
(St. 521) 61° 42′ N, 49° 46′ W, 260 m., 100 m. wire, 9—7—1909, 15 spec.
(St. 329) 62° 36′ N, 54° 12′ W, pelagic townet, 6—5—1909, many, very little spec. (1 cm.^{3}).
(St. 29) 62° 45′ N, 57° 11′ W, 7—6—1908, 10 spec.
(St. 30a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, 2 spec.
(St. 30b) — — 70 m. wire, — 8 spec.
(St. 31a, St. 31c) 63° 11′ N, 56° 23′ W, pelagic townet, 7—6—1908, 5 spec.
(St. 37b) 63° 47′ N, 52° 12′ W, 100 m. wire, 9—6—1908, 4 spec.
(St. 76) 63° 49′ N, 53° 27′ W, 1300 m., 1000 m. wire, 23—6—1908, 1 spec.
(St. 69) 63° 53′ N, 53° 28′ W, 600 m., surface, 22—6—1908, many spec. (3 cm.^{3}).
(St. 405) 64° 25′ N, 56° 12′ W, 100 m. wire, 2—6—1909, many, very little spec. (1 cm.^{3}).
(St. 423) 65° 03′ N, 54° 16′ W, 80—100—120 m. wire, 7—6—1909, many spec. (15 cm.^{3}).
(St. 196d) 68° 40′ N, 53° 12′ W, 410 m., 350 m. wire, 17—8—1908, many spec. (150 cm.^{3}).
(St. 125) 69° 17′ N, 52° 14′ W, 550 m. wire, 16—7—1908, many spec. (75 cm.^{3}).

(St. 124) 69° 17′ N, 52° 14′ W, 150 m. wire, 16.—7.—1908, many spec. (5 cm.^{3}).
(St. 171) 70° 41′ N, 52° 07′ W, 386 fath., 800 m. wire, 6—8—1908, many spec. (10 cm.^{3}).
(St. 172) 70° 42′ N, 52° 14′ W, 450 m. wire, 6—8—1908, many spec. (15 cm.^{3}).

In "V. Grønland" 1887 H. J. Hansen mentions the species only from 5 localities (ca. 64°—77° 40' N).

47. **Socarnes Vahlii** Kr.

Lysianassa Vahlii Krøyer, Grønlands Amfipoder, Kgl. Danske Vid. Selsk. naturvid. math. Afh., vol. 7. 1838, p. 233.
Anonyx — — in Gaimard: Voyage en Scand., Crust. 1846 (1849?) Pl. 14, fig. 1.
**Socarnes* — G. O. Sars, Account, vol. 1, Amphip., p. 45, Pl. 16, fig. 2.
— — Stebbing, Tierreich, p. 57 (ubi litt.).
— — H. J. Hansen, V. Grønland 1887, p. 62.

St. 465) 62° 58′ N, 50° 52′ W, 25 fath., 80 m. wire. 21—6—1909, 2 spec.

48. **Hippomedon abyssi** Goës.

**Lysianassa abyssi* Goës, Crust. Amphip. Spetsberg., Öfvers. Akad. Förhandl., vol. 22, 1866, p. 519, Pl. 37, fig. 5.
Paratryphosites — Stebbing, Tierreich, p. 43 (ubi litt.).
Hippomedon — H. J. Hansen, V. Grønland 1887. p. 66.

St. 118) 69° 17′ N, 52° 50′ W, clay-bottom, ca. 225 fath., trawl., 15—7—1908, 7 spec.

49. **Cyphocaris anonyx** Boeck.

Cyphocaris anonyx Boeck, Crust. Amphip. boreal. et arctica, Forh. Vid. Selsk., Christiania, 1870, p. 104.
— — — Skand. og arkt. Amphip., 1873—76, p. 141, Pl 6, fig. 1.
* — *micronyx* Stebbing, Challenger Report. vol. 29. 1888, p. 656. Pl. 16.
— — Chevreux, Amphip. . . . del'Hirondelle, Result. Camp. sc., fasc. 14, Monaco 1900, p. 164, Pl. 14, fig. 11 (coloured fig.).
— *anonyx* Stebbing, Tierreich, p. 29.
— — H. J. Hansen, V. Grønland 1887. p. 66.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 5 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1200—1500 m. wire, 9—6—1909, 2 spec.
(St. 30a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, 1 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m, 1530 m. wire, 7—5—1909, 2 spec.
(St. 338) 64° 01′ N, 55° 30′ W, 1185 m., 1400—1500 m. wire, 8—5—1909. 2 spec.

(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909, 2 spec.
(St. 346) 64° 22′ N, 56° 00′ W, 400—800 m. wire, 10—5—1909, 2 spec.
(St. 348) 64° 35′ N, 56° 18′ W, 900 m. wire, 11—5—1909, 1 spec.

New to W. Greenland. In V. Grønland 1887 H. J. Hansen mentions the species from 30 miles S. O. to Cap Farewell, 300 fath., but not from W. Greenland.

50. **Metacyphocaris Helgæ** Tattersall.

Metacyphocaris Helgæ Tattersall, Pelagic Amphipoda of the Irish Atlantic slope. Fisheries, Ireland, Sci. Invest., 1905, pt. IV (1906), p. 29, Pl. 3, fig. 1, Pl. 4, fig. 1—14.

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 6 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1530 m. wire, 1300 m., 7—5—1909, 5 spec.
(St. 338) 64° 01′ N, 55° 30′ W, 1185 m., 1400—1500 m. wire, 8—5—1909, 2 spec.

New to Greenland. Tattersall (l. c.) mentions 17 spec. from 4 localities at W. Ireland.

51. **Aristias tumidus** Kr.

Anonyx tumidus Kröyer, in Gaimard, Voyage en Scand., Crust., 1846 (1849?) Pl. 16, fig. 2.
— — — Karcin. Bidrag, Naturhist. Tidsskrift, Ny Række, vol. 2, 1846, p. 16, 40.
**Aristias* — G. O. Sars, Account, vol. 1, Amphip, 1895, p. 49, Pl. 18, fig. 1.
— — Stebbing, Tierreich, p. 49 (ubi litt.)
— — H. J. Hansen, V. Grönland 1887, p. 67.
non *Aristias tumidus* Bruzelius, Kgl. Svenska Vet.-Akad. Handl., n. ser., vol. 3, 1859, no. 1, p. 41.

(St. 465) 62° 58′ N, 50° 52′ W, ca. 25 fath., 21—6—1909, 1 spec.

52. **Alibrotus littoralis** Kr.

Anonyx littoralis Kröyer, in Gaimard: Voyage en Scand., Crust., 1846 (1849?) Pl. 13, fig. 1.
— *litoralis* Kröyer, Karcin. Bidrag, Naturh. Tidsskrift, Ny Række, vol. 1, 1845, p. 621; vol. 2, 1846, p. 36.
**Alibrotus littoralis* G. O. Sars, Account, vol. 1, Amphip., 1895, p. 102 Pl. 35, fig. 2.
Pseudalibratus litoralis Stebbing, Tierreich, p. 33.
Onisimus — H. J. Hansen, V. Grönland, 1887, p. 73.

Kangerdluarsuk (61° 50′ N), from stomachs of herrings, 28—6—1909, many spec. (15 cm.^{3}).

53. **Katius obesus** Chevreux.

**Katius obesus* Chevreux, Description d'un Amphipode (Katius obesus nov. gen. et sp.) Bull. Mus. Océanogr., Monaco, No. 35, 1905 (with figs.)
— — Tattersall, Pelagic Amphipoda of the Irish Atlantic slope, Fisheries, Ireland, Sci. invest., 1905, pt. 4 (1906), p. 29.

(St. 15) 58° 08′ N, 39° 24′ W, 500 m. wire, 26—5—1908, 22 spec.
(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1905, 2 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1600 m., 1200—1500 m. wire, 9—6—1909, 7 spec.
(St. 333) 63° 18′ N, 54° 55′ W, 1300 m., 1530 m. wire, 7—5—1909, 2 spec.
(St. 338) 64° 01′ N, 55° 30′ W, 1185 m., 1400—1500 m. wire, 8—5—1909, 1 spec.
(St. 410) 64° 14′ N, 55° 55′ W, 839 m., trawl, 3—6—1909, 1 spec.

New to Greenland.

Most of the specimens from the "Tjalfe" measure 25 mm. (the specimen of Chevreux is 12 mm.), and where the colour is preserved it is bright scarlet. Hitherto but two specimens of the species were known, viz., from 36° 17′ N, 28° 53′ W, 3410 m., 0—3000 m. wire 1 spec. (Chevreux l. c.,), and 50 miles N. to W. of Eagle Island, Co. Mayo, 1200 fath., 1 spec. (Tattersall l. c.).

54. **Pontoporeia femorata** Kr.

Pontoporeia femorata Kröyer, Nye nordiske Sl. og Arter af Amfip., Naturh. Tidsskrift, vol. 4, 1842, p. 153.
— — — in Gaimard, Voyage en Scand., Crust., 1846 (1849?) Pl. 23, fig. 2.
* — — G. O. Sars, Account, vol. 1, Amphip. 1895, p. 123, Pl. 41, fig. 1.
— — Stebbing, Tierreich, p. 128 (ubi. litt.)
— — H. J. Hansen, V. Grønland 1887, p. 80.

(St. 118) 69° 17′ N. 52° 50 W, clay-bottom, ca. 225 fath.. trawl, 15—7—1908, 1 spec.

55. **Stegocephalus inflatus** Kr.

Stegocephalus inflatus Kröyer, Nye nordiske Sl. og Arter af Amfip., Naturh. Tidsskrift, vol 4, 1842, p. 150.
— — Kröyer, in Gaimard, Voyage en Scand., Crust., 1846 (1849?) Pl. 20, fig. 2.
* — G. O. Sars, Account. vol. 1, Amphip, 1895, p. 198, Pl. 69.

Stegocephalus inflatus Stebbing, Tierreich, p. 91 (ubi litt.)
— — H. J. Hansen, V. Grønland 1887, p. 87.

(St. 397) 66° 42′ N, 56° 12′ W, 130 fath., trawl, 31—5—109, 1 spec.
(St. 370) 66° 45′ N, 56° 23′ W, ca. 175 fath., trawl, 20—5—1909, 1 spec.
(St. 177) 70° 42′ N, 54° 48′ W, 253 fath., trawl, 7—8—1908, 1 spec.

The spec. from St. 397 is 37 mm., the two other are but a little smaller.

56. **Metopa pollexiana** Sp. Bate.

Montagua pollexiana Sp. Bate, Rep. Brit. Ass. f. the Adv. of Sc., 1855. p. 57 (nomen nudum).
**Metopa* — G. O. Sars, Account, vol. 1, Amphip., 1895, p. 269, Pl. 95.
— *norvegica* Stebbing, Tierreich, p. 177 (ubi litt).
— *pollexiana* H. J. Hansen, V. Grönland 1887, p. 92, Pl. 3, fig. 5.

(St. 52) Kugssukfjord (Godthaabsfjord), 156 fath., trawl, 15—6—1608, ca. 25 spec.

57. **Cleonardo microdactylus** n. sp. (fig. 3—4).

(St. 336) 64° 06′ N, 55° 18′ W, 1040—1100 m., 1200 m. wire, 8—5—1909, 2 spec., ♀.

Upon the whole we know 6 species of the genus *Cleonardo*. viz. *C.* (*Tritropis*) *appendiculatus* G. O. Sars (Norske Nordhavs-Exp. Crust. I, 1885, p. 194, Pl. 16, fig. 3), *C. longipes* Stebbing (Challenger Report, Zool., vol. 29, p. 959, Pl. 86), *C. Neuvillei*, *C. longirostris*, *C. spinicornis* and *C. biscayensis* Chevreux (Bull. Inst. Océanogr. Monaco, No. 121, 1908, p. 1—12 (all the four species), fig. 1—6). Knowledge of the species is very defective, for they are bathypelagic and known in but single specimens; of most of the species we know but one sex.

As I have given figs. of all the appendages (except the pleopoda) I shall give but a very short description.

Length 7 mm.

♂ unknown. — ♀: The head with rostrum a little shorter than the first segment; this is somewhat longer than the following ones. The eyes are distinct, rather large and uncoloured. The side-plates 1—4 rounded below. Pereion is inflated, the back rounded

and the segments 1—2 have a distinct, but low dorsal carina as in *C. appendiculatus*; the postero-lateral corners on these 3 segments acutely produced. Telson has about the same form as in the other species (unknown in *C. appendiculatus*). The antennæ

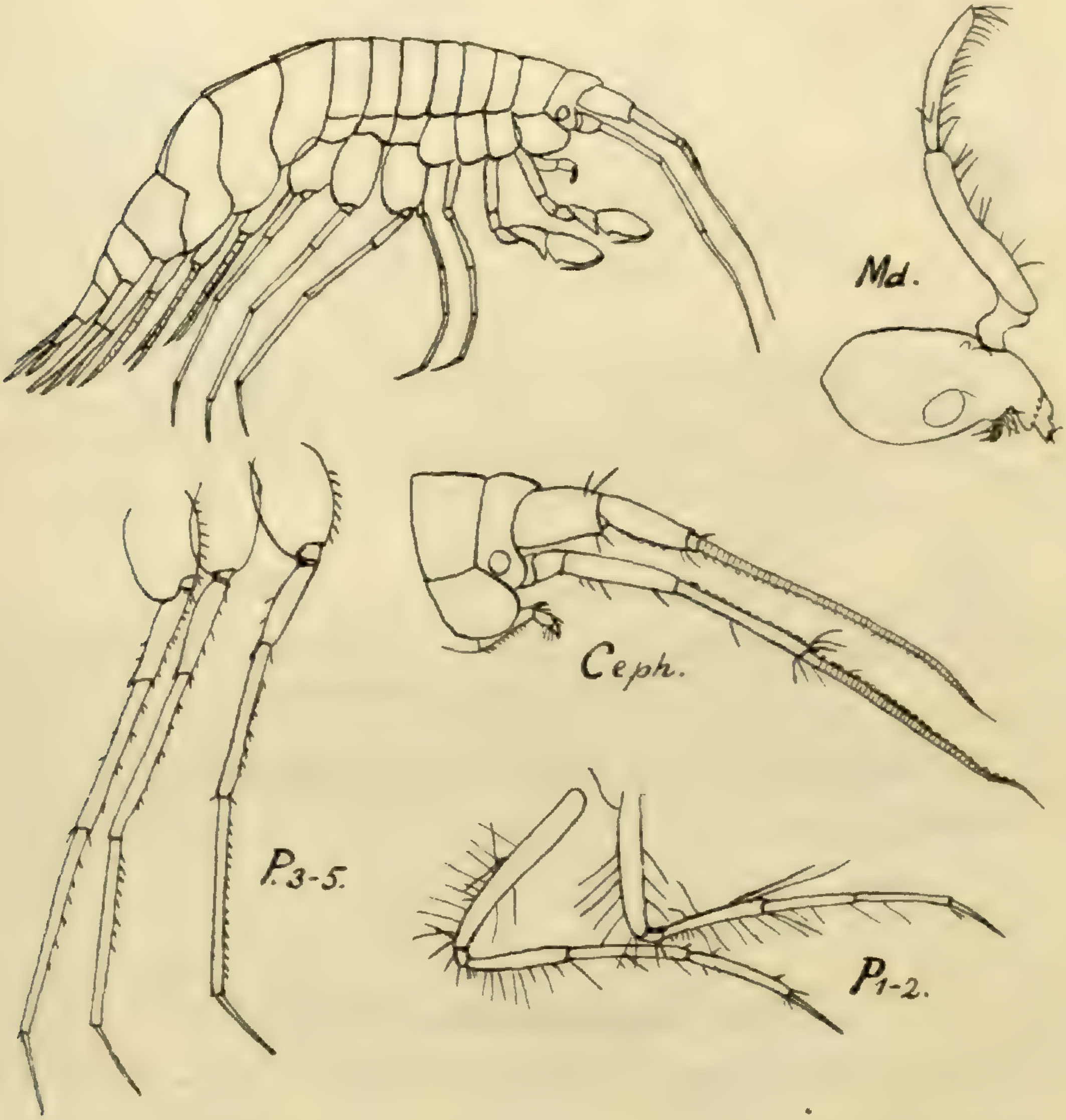


Fig. 3. *Cleonardo microdactylus.*

are about half as long as the body; ant. 1 a little shorter than ant. 2. In antenna 1 the first joint is stout about as in *C. longipes*; the second joint is of equal length, but much narrower; the third very short. In antenna 2 the ultimate joint in the peduncle is a little shorter and narrower than the penultimate; flagellum

a little shorter than the peduncle. The form of the oral parts may be seen from the figs. In the two gnathopoda the 5th joint has about the same form as in *C. longipes*. Pereiopoda 1—5 have the usual form, but in p. 3—5 the dactylus is not half as long

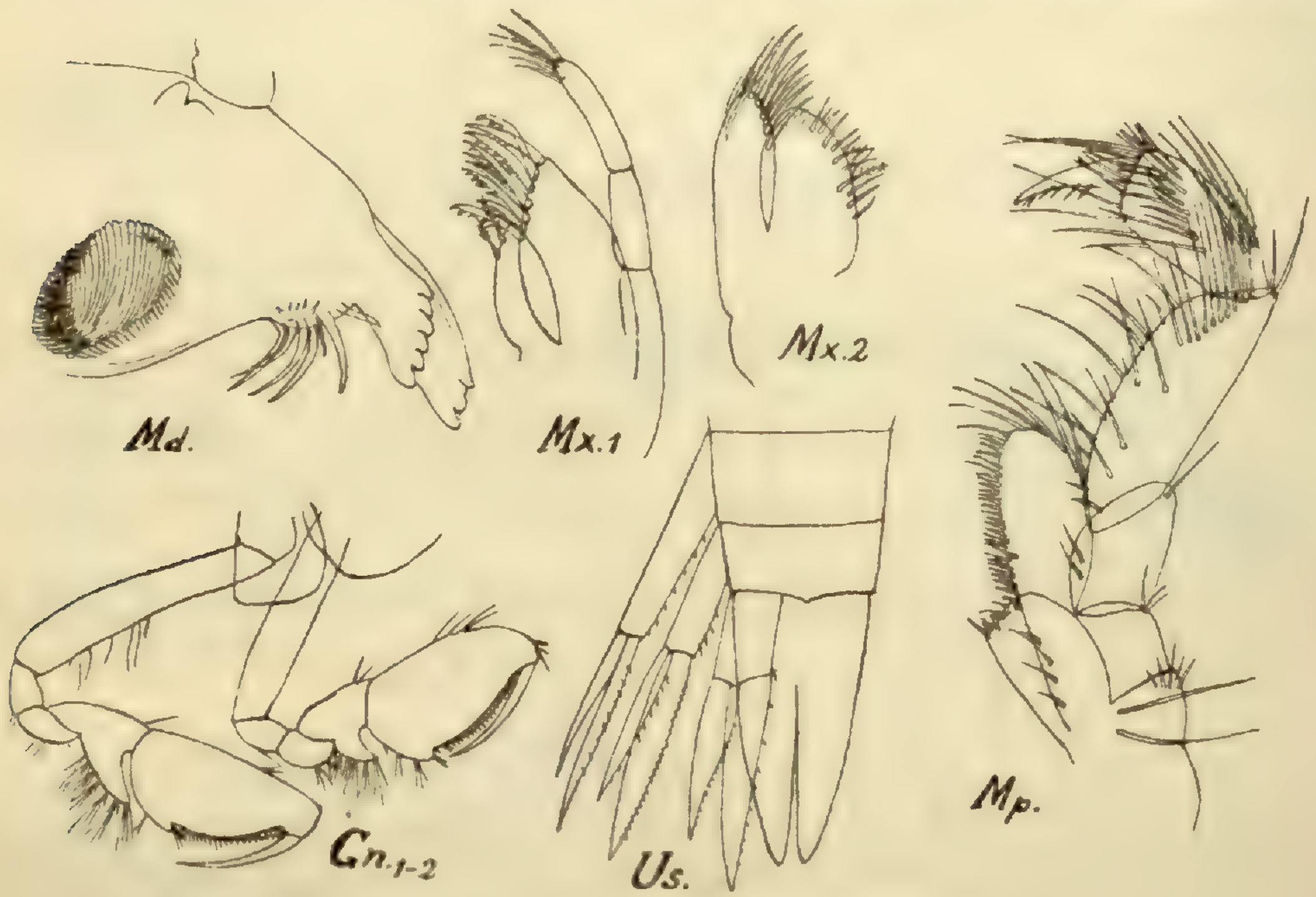


Fig. 4. *Cleonardo microdactylus.*

as the 6th joint; in the other species the dactylus always is at least half as long as the 6th joint, in some of the specimens somewhat longer. The pleopoda have the usual form. The form and length of the uropoda may be seen from the fig.

58. **Paramphithoë pulchella** Kr.

Amphitoe pulchella Krøyer, in Gaimard, Voyage en Scand., Crust. 1846 (1849?) Pl. 10, fig. 2.

**Paramphithoe pulchella* G. O. Sars, Account, vol. 1, Amphip., 1895, p. 346, Pl. 122, fig. 1.

Neopleustes pulchellus Stebbing, Tierreich, p. 312 (ubi litt.).

Paramphithoe pulchella H. J. Hansen, V. Grønland 1887, p. 119, Pl. 5, fig. 2.

(St. 40c) 63° 48′ N, 52° 23′ W, 194 m., trawl, 10—6—1908, 1 spec.

59. **Paramphithoë bicuspis** Kr.

Amphithoe bicuspis Krøyer, Grønlands Amfipoder, Kgl. Danske Vid. Selsk. math. naturvid. Afh., vol. 7, 1838, p. 273, Pl. 2, fig. 10.

**Paramphitoe bicuspis* G. O. Sars, Account, vol. 1, Amphip., 1895. p. 349, Pl. 123, fig. 1.
Neopleustes . — Stebbing, Tierreich, p. 313 (ubi litt.).
Paramphithoe — H. J. Hansen, V. Grønland 1887, p. 122.

(St. 465) 62° 58′ N. 50° 52′ W, 25 fath., 21—6—1909, 10 spec.

60. **Epimeria loricata** G. O. Sars.

Epimeria loricata G. O. Sars, Crust. et Pycnog. nova, Archiv f. Mat. og Naturvid., vol. 4, 1879, p. 450.
* — — — Account, vol. 1, Amphip., 1895, p. 368, Pl. 129, fig. 3.
— — Stebbing, Tierreich, p. 322 (ubi litt.).
— — H. J. Hansen, V. Grønland 1887, p. 126.

(St. 431) 63° 24′ N. 53° 10′ W, 892 m., trawl, 9—6—1909, 1 spec.
(St. 396) 66° 41′ N. 56° 17′ W, 150 fath., trawl, 31—5—1909. 1 spec.
(St. 397) 66° 42′ N. 56° 12′ W, 130 fath., trawl, 31—5—1909, 1 spec.

The largest specimen (St. 397) is 38 mm. long.

61. **Acanthonotosoma inflatum** Kr.

Acanthonotus inflatus Krøyer, Nye nord. Slægt. og Arter af Amfip, Naturh. Tidsskrift vol. 4, 1842, p. 161.
* *Vertumnus* — Goës, Crust. Amphip. Spetsberg., Öfvers. Kgl. Svenska Vet. Akad. Förh., 1866, p. 523, Pl. 38, fig. 11.
Acanthonotozoma inflatum Stebbing, Tierreich, p. 219.
Acanthonotosoma — H. J. Hansen, V. Grønland 1887, p. 127.

(St. 143) Outside the Mudderbugt (Disco) 128 fath., trawl, 22—7—1908, 1 spec.

62. **Acanthonotosoma serratum** O. Fabr.

Oniscus serratus O. Fabricius, Fauna Groenlandica, 1780, p. 262, No. 237.
**Acanthonotosoma serratum* G. O. Sars, Account, vol. 1, Amphip., 1895. p. 374, Pl. 131, fig. 1.
Acanthonotozoma — Stebbing, Tierreich, p. 218.
Acanthonotosoma H. J. Hansen, V. Grønland 1887, p. 127.

(St. 465) 62° 58′ N, 50° 52′ W, 25 fath., 21—6—1909, 1 spec.

63. **Acanthozone cuspidata** Lepechin.

Oniscus cuspidatus Lepechin, Tres Onisc. spec. descript., Acta Acad. Scient. Imp. Petrop., 1778, pars 1, p. 247, Pl. 8, fig. 3.

**Acanthozone cuspidata* G. O. Sars, Account, vol. 1, Amphip., 1895, p. 370, Pl. 130.
?Paramphithoe hystrix Stebbing, Tierreich, p. 325 (ubi litt.).
Acanthozone cuspidata H. J. Hansen, V. Grønland 1887, p. 128.

(St. 143) Outside the Mudderbugt (Disco), 128 fath., trawl, 22—7—1908, ca. 20 spec.

64. **Parapleustes latipes** M. Sars.

Amphithoe latipes M. Sars, Oversigt ov. Norges Arkt. Krebsdyr, Forhandl. Vid. Selsk. Christiania 1858 (1859), p. 139.
**Parapleustes latipes* G. O. Sars, Account, vol. 1, Amphip., 1895, p. 360, Pl. 127.
Sympleustes — Stebbing, Tierreich, p. 317 (ubi litt.).
Amphitopsis — H. J. Hansen, V. Grønland 1887, p. 135, Pl. 5, fig. 4,

(St. 367) 66° 22′ N, 57° 16′ W, 686 m., dredge, 19—5—1909, 1 spec.

65. **Syrrhoe crenulata** Goês.

Syrrhoe crenulata Goës, Crust. Amphip. Spetsberg., Öfvers. Kgl. Svenska Vet. Akad. Förhandl., 1866, p. 527, Pl. 40, fig. 25.
— — G. O. Sars, Account, vol. 1, Amphip. 1895, p. 390. Pl. 136.
— — Stebbing, Tierreich, p. 282 (ubi litt.).
— — H. J. Hansen, V. Grønland 1887, p. 103.

(St. 465) 62° 58′ N, 50° 52′ W, 25 fath., 21—6—1909, 3 spec.

66. **Pardalisca cuspidata** Kr. (non Buchholz).

Pardalisca cuspidata Krøyer, Nye nord. Sl. og Arter af Amfip., Nat. Tidsskrift, vol. 4, 1842, p. 153.
* — — G. O. Sars, Account, vol. 1, Amphip., 1895, p. 403, Pl. 141, Pl. 142, fig. 1.
— — Stebbing, Tierreich, p. 223 (ubi litt.).
? — — H. J. Hansen, V. Grønland 1887, p. 143.
non — — Buchholz, Zweite Deutsche Nordpolarfahrt, vol. 2, Crust. 1874, p. 306, Pl. 1, fig. 3, Pl. 2, fig. 1 (= P. abyssi Boeck, teste Stebbing, Tierreich, p. 222).

(St. 465) 62° 58′ N, 50° 52′ W, 25 fath., 21—5—1909, 2 spec.

67. **Eusirus Tjalfiensis n. sp.**

(St. 171) 70° 41′ N, 52° 07′ W, 386 fath., 800 m. wire, 6—8—1908, 1 spec.

At the mentioned locality the "Tjalfe" has taken one specimen, unfortunately rather defective, of a new species of the genus *Eusirus*.

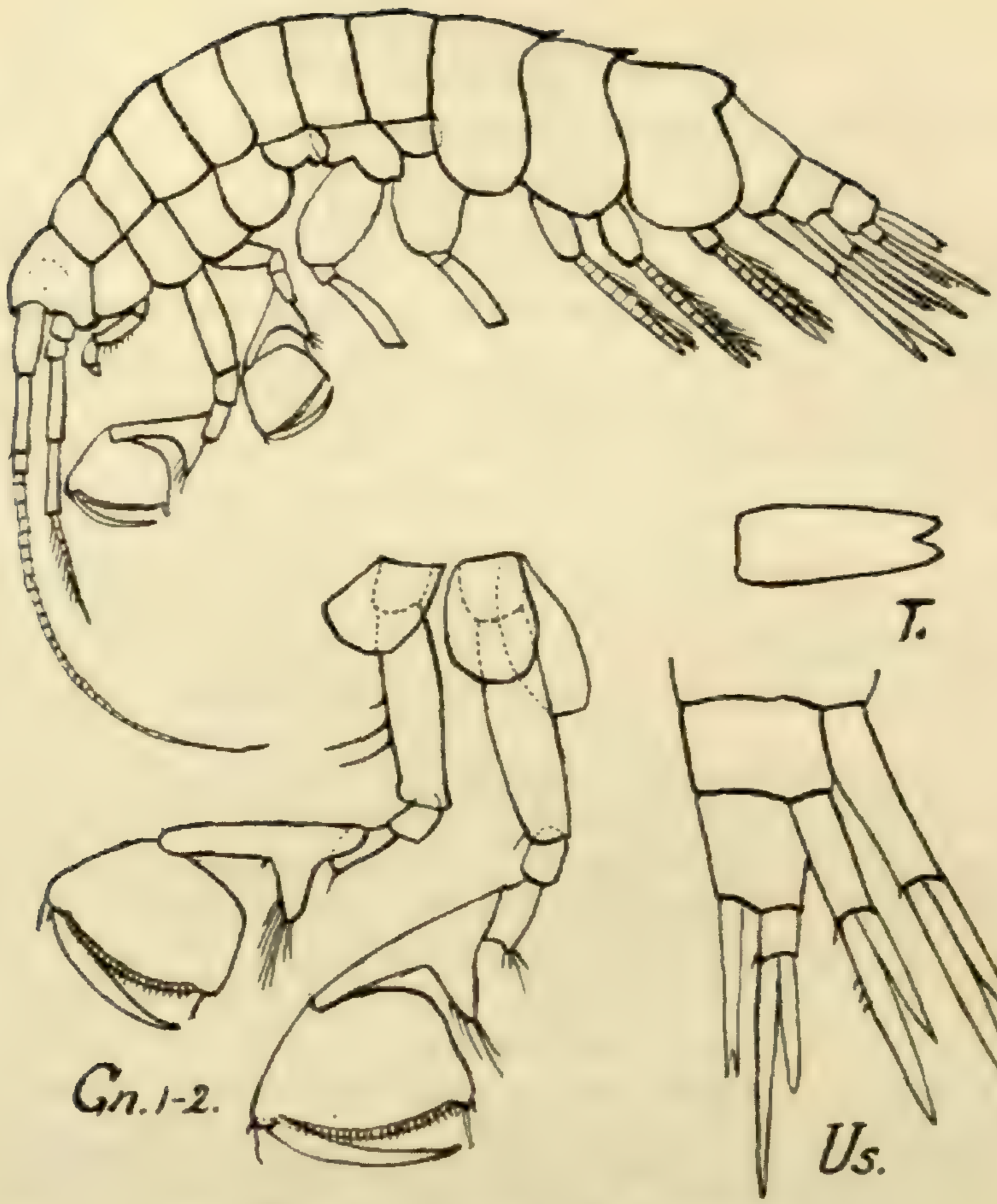


Fig. 5. *Eusirus Tjalfiensis.*

Total length 8 mm.

Of the known species of the genus it is most like *E. cuspidatus* Kr., but it differs chiefly in the following regards. The eyes are almost quite invisible. The pereion segment 7 has no tooth in the dorsal line, and the pleon segments 1 and 2 are evenly rounded on the hinder lateral corners. The convex lateral margin of the posterior edge of the pleon segment 3 seems to have some single small teeth. The telson is most like that in *E. Holmi* H. J. Hansen. The gnathopoda 1—2 are long and slender, about as in *E. Holmi.* The pereiopoda 1—3 are quite lost; the pereiopoda 4—5 are only partly preserved. The specimen seems to be a ♂; at all events it has no marsupial plates.

As may be seen the description is very imperfect, for only one specimen was brought home, and this single specimen was very defective, as is said above; but in the figures I have given all details to be seen without dissection.

68. **Eusirus Holmii** H. J. Hansen.

**Eusirus Holmii* H. J. Hansen, Dijmphna-Togtets zool.-botan. Udbytte, 1887, p. 224, Pl. 22, fig. 1.
– — Stebbing, Tierreich, p. 342 (ubi litt.).

(St. 363) 66° 21′ N, 57° 04′ W, 680 m., 800 m. wire, 18—5—1909, 1 spec.
(St. 171) 70° 41′ N. 52° 07′ W, 386 fath., 800 m. wire, 6—8—1908, 1 spec.

New to W. Greenland; but the species has been taken at E. Greenland (70° 32' N, 8° 11' V, 470 fath. (H. J. Hansen, Meddel. om Grønland, vol. 19, 1895, p. 128); this locality is not mentioned in Stebbing, Tierreich).

69. **Apherusa glacialis** H. J. Hansen.

**Amphitopsis glacialis* H. J. Hansen, V. Grønland 1887, p. 137, Pl. 5, fig. 6.
Apherusa — Stebbing, Tierreich, p. 307 (ubi litt.).

(St. 324) 60° 07′ N, 48° 26′ W, pelagic townet, 3—5—1909, 1 spec.
(St. 321) — — 600 m. wire, — 4 spec.
(St. 465) 62° 58′ N, 50° 52′ W, ca. 25 fath., 21—6—1909, 1 spec.

Like the specimens of H. J. Hansen those from "Tjalfe" are also very imperfect: all have some legs or the antennæ broken.

70. **Amphitopsis longicaudata** Boeck.

Amphitopsis longicaudata Boeck, Forh. Skand. Naturforsker-Møde, 1861, p. 663.
* — — G. O. Sars, Account, vol. 1, Amphip. 1895, p. 456, Pl. 161.
— — Stebbing, Tierreich, p. 289 (ubi litt.).

(St. 143) Outside the Mudderbugt (Disco), 128 fath., trawl, 22—7— 1908, ca. 35 spec.

New to Greenland.

71. **Gammarus locusta** L.

Cancer locusta Linné, Fauna Suecica, Edit. altera, 1761, p. 405, No. 2042.
**Gammarus locusta* G. O. Sars, Account, vol. 1, Amphip. 1895, p. 499, Pl. 1, Pl. 176, fig. 1.
— — Stebbing, Tierreich, p. 476 (ubi litt.).
— — H. J. Hansen, V. Grønland 1887, p. 144.

(St. 23) 58° 01′ N, 51° 36′ W, surface, 1—6—1908, 1 spec.
(St. 521) 61° 42′ N, 49° 46′ W, 260 m., 100 m. wire, 9—7—1909, 3 spec.
(St. 434) 62° 53′ N, 54° 15′ W, 1660 m., 1200—1500 m. wire, 9—6—1909, 1 spec.
(St. 30a) 63° 04′ N, 56° 32′ W, 500 m. wire, 7—6—1908, 1 spec.
(St. 30b) — — 70 m. wire, — 1 spec.
(St. 433) 63° 05′ N, 54° 21′ W, 120—180 m. wire, 9—6—1909, 8 spec.
(St. 425) 64° 24′ N, 53° 05′ W, 80—120 m. wire, 8—6—1909, 5 spec.
(St. 423) 65° 03′ N, 54° 16′ W, 80—100—120 m. wire, 7—6—1909, 1 spec.

The localities from the "Tjalfe" show that this species can live pelagically at a much greater distance from the coast, than has been known hitherto. G. O. Sars (l. c., p. 500) writes „.... this species is .... met with in the littoral and sublittoral regions. It also occasionally descends to greater depths, at least to 50 fathoms, and in some places occurs in great abundance among decaying algæ, accumulated on the bottom ...". H. J. Hansen says (l. c., p. 145) „a couple of times it has been taken in the Davis-Strait in the surface" (without locality), but he believes that ordinarily it lives on the bottom at 0—5 fath.; he is of the opinion that localities on 60, 100 or 200 fathoms are not certain.

?72. **Haploops setosa** Boeck.

Haploops setosa Boeck, Crust. Amphip. bor. et arct., Forh. Vid. Selsk. Christiania 1870 (1871), p. 228.
* — — G. O. Sars, Account vol. 1, Amphip., 1895, p. 194, Pl. 68, fig. 1.
— — Stebbing, Tierreich, p. 117 (ubi litt.).
— — H. J. Hansen, V. Grønland 1887, p. 153.

(St. 367) 66° 22′ N, 57° 16′ W, 686 m., dredge, 19—5—1909, 1 spec.

My determination is not sure, because the specimen is somewhat imperfect and has lost the setæ of the dorsal surface.

73. **Unciola crassipes** H. J. Hansen.

**Unciola crassipes* H. J. Hansen, V. Grønland 1887, p. 165, Pl. 6, fig. 6.
— — Stebbing, Tierreich, p. 679.

(St. 367) 66° 22′ N, 57° 16′ W, 686 m., dredge, 19—5—1909, 2 spec.

Isopoda.

74. **Calathura brachiata** Stimps.

Anthura brachiata Stimpson, Marine Invertebr. Grand Manan; Smithson. Contrib. to Knowl., vol. 6, 1854, p. 43.
**Calathura* — G. O. Sars, Account vol. 2, Isop., 1900, p. 46, Pl. 19, fig. 2.
— *branchiata* Richardson, Isop. of N. Am., Bull. U. S. Nat. Mus, No. 54, 1905, p. 72, (ubi litt.), fig. 56—57.
— *brachiata* H. J. Hansen, V. Grønland 1887, p. 181.

(St. 367) 66° 22′ N, 57° 16′ W, 686 m., dredge, 19—5—1909, 6 spec.

75. *Æga psora* L.

Oniscus psora Linné, Systema Naturæ, edit. X, vol. 1, 1758, p. 636.
**Æga* — G. O. Sars, Account vol. 2, Isop., 1900, p. 59, Pl. 24.
— — Richardson, Isop. af N. Am., Bull. U. S. Nat. Mus., No. 54, 1905, p. 168 (ubi litt.), fig. 148.
— — H. J. Hansen, V. Grønland 1887, p. 183.

(St. 396) 66° 41′ N, 56° 17′ W, 150 fath., trawl, 31—5—1909, 2 spec.
(St. 397) 66° 42′ N, 56° 12′ W, 130 fath., trawl, 31—5—1909, 6 spec.

All the specimens were taken free-living on the bottom.

76. *Æga ventrosa* M. Sars.

Æga ventrosa M. Sars, Vid. Selsk. Forh., Christiania, 1859, p. 154.
* — — G. O. Sars, Account vol. 2, Isop., 1900, p. 64, Pl. 26, fig. 3.
— — Richardson, Isop. of N. Am., Bull. U. S. Nat. Mus. No. 54, 1905, p. 187 (ubi litt.), fig. 173—74.
— *Nordenskiöldii*, H. J. Hansen, V. Grønland 1887, p. 184.

(St. 397) 66° 42′ N, 56° 12′ W, 130 fath., trawl, 31—5—1909, 1 spec. (free-living).

77. **Arcturus Baffini** Sabine.

Idotea Baffini Sabine, Suppl. to the App. to Capt. Parry's Voyage, 1824, p. 228, Pl. 1, fig. 4—6.
**Arcturus* — G. O. Sars, Norske Nordhavs-Exp., Crust., 1885, p. 97, Pl. 9, fig. 1—21.
— — Richardson, Isop. of N. Am., Bull. U. S. Nat. Mus. No. 54, 1905, p. 337 (ubi litt.), fig. 367—68.
— — H. J. Hansen, V. Grønland 1887, p. 188.

(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fath., trawl, 5—7—1908, 1 spec.

(St. 107) 68° 20′ N, 54° 03′ W, 220—280 fath., trawl, 9—7—1908, 4 spec.
(St. 199) 68° 28′ N, 54° 47′ W, 184—245 fath., trawl, 18—8—1908, 2 spec.

The two largest specimens (St. 107) are 55 mm. (body) + 68 mm. (ant.) and 45 mm. + 78 mm.; the specimen from St. 100 measures 47 mm. + 70 mm.

78. **Acanthoniscus typhlops** G. O. Sars.

**Acanthoniscus typhlops* G. O. Sars, Norske Nordhavs-Exp., Crust. 1885. p. 119, Pl. 10, fig. 27—30.

(St. 431) 63° 24′ N, 53° 10′ W, 892 m., trawl, 9—6—1909, 1 spec.

New to Greenland. Hitherto it was known only from W. of Lofoten, 68° 21′ N, 10° 40′ E, 457 fath., ÷ 0,7° C. (Sars, l. c.).

79. **Janthe laciniata** G. O. Sars.

Janthe laciniata G. O. Sars, Vid. Selsk. Forh., Christiania 1872, p. 92.
* — — — Account vol. 2, Isop., 1900, p. 101, Pl. 41.

(St. 431) 63° 24′ N, 53° 10′ W, 892 m., trawl, 9—6—1909, 1 spec.
(St. 369) 66° 45′ N, 56° 30′ W, ca. 200 fath., trawl, 20—5—1909, 1 spec.

New to Greenland.

80. **Munneurycope Tjalfiensis,** n. gen. n. sp. (figs. 6—8).

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 1 spec. (♂).

The specimen is very like *Munnopsis (?) Murrayi* Walker (Ann. Mag. Mat. Hist. ser. 7, vol. 12, 1903, p. 227, Pl. 18, figs. 1—6; Tattersall, Isop., Fisheries, Ireland, Sci. Invest. 1904 pt. 2 (1905), p. 24,73, Pl. 5, fig. 8, and Tattersall, Nordisches Plankton vol. 6, Lief. 14, 1911, p. 190, figs. 8—14); but though it is very imperfect, not only the larger part of antennæ and pereiopoda being lost, but also otherwise being damaged, it is yet certain that it is another species.

Both species differ from *Munnopsis typica* G. O. Sars (Sars: Account vol. 2, 1900, Isop., p. 133, Pl. 57—58) in the somewhat regular lanceolate outline, the hinder part of the body being not

suddenly narrower than the first segments. In regard to the mandibles (figs. 7—8) the specimen from the "Tjalfe" is very like *Munnopsis longicornis* H. J. Hansen (Ergebnisse d. Plankton-Exp., vol. 2 G c, Isop., Cumac. und Stomatop., 1895, p. 8, Pl. 2, fig. 1—1d), whilst the mandibles in *M. typica* are quite different from these.

Walker gives no fig. of the mandibles of *M. Murrayi* (Tattersall has a fig.: Fisheries, Ireland, Sci. Invest. 1904 pt. 2, (1905) Pl. 5, fig. 8); but he writes (l. c. 1903 p. 228) „mandibles with a prominent molar expansion and divided cutting edge as in *M. longicornis* Hansen; palp very large and prominent, with a lamellar terminal joint. As G. O. Sars has pointed out, *Munnopsis longicornis* Hansen differs in the structure of the mandibles from the generic description, as does the present species" (*M. Murrayi*).

Fig. 6.
Munneurycope Tjalfiensis.

The sculpture of the dorsal surface is very like that in *M. Murrayi;* the few differences may be seen from the fig. (fig. 6). Of ant. 1 the mutual length of the joints is quite another than in *M. typica*, 4th and 5th joints being longer than the others. Also the flagellum is different, 1st joint being very short and the second very long; the other joints (only 6 are preserved) are about 4 times longer than their diameter. Of ant. 2 only two joints of the stem are preserved; they are of about equal length. Labrum is very prominent, has the usual form and 3 cross-furrows. The oral parts agree very well with those in *M. longicornis* and *M. Murrayi*, whilst the mandibles as mentioned are very different from those in *M. typica.* Of the 4 pairs of ambulatory legs only some single joints are preserved. Of the natatory legs the 4 first joints are preserved; the 4th joint has the same form as in *M. Murrayi* and is a little broader than in *M. longicornis*, but much broader than

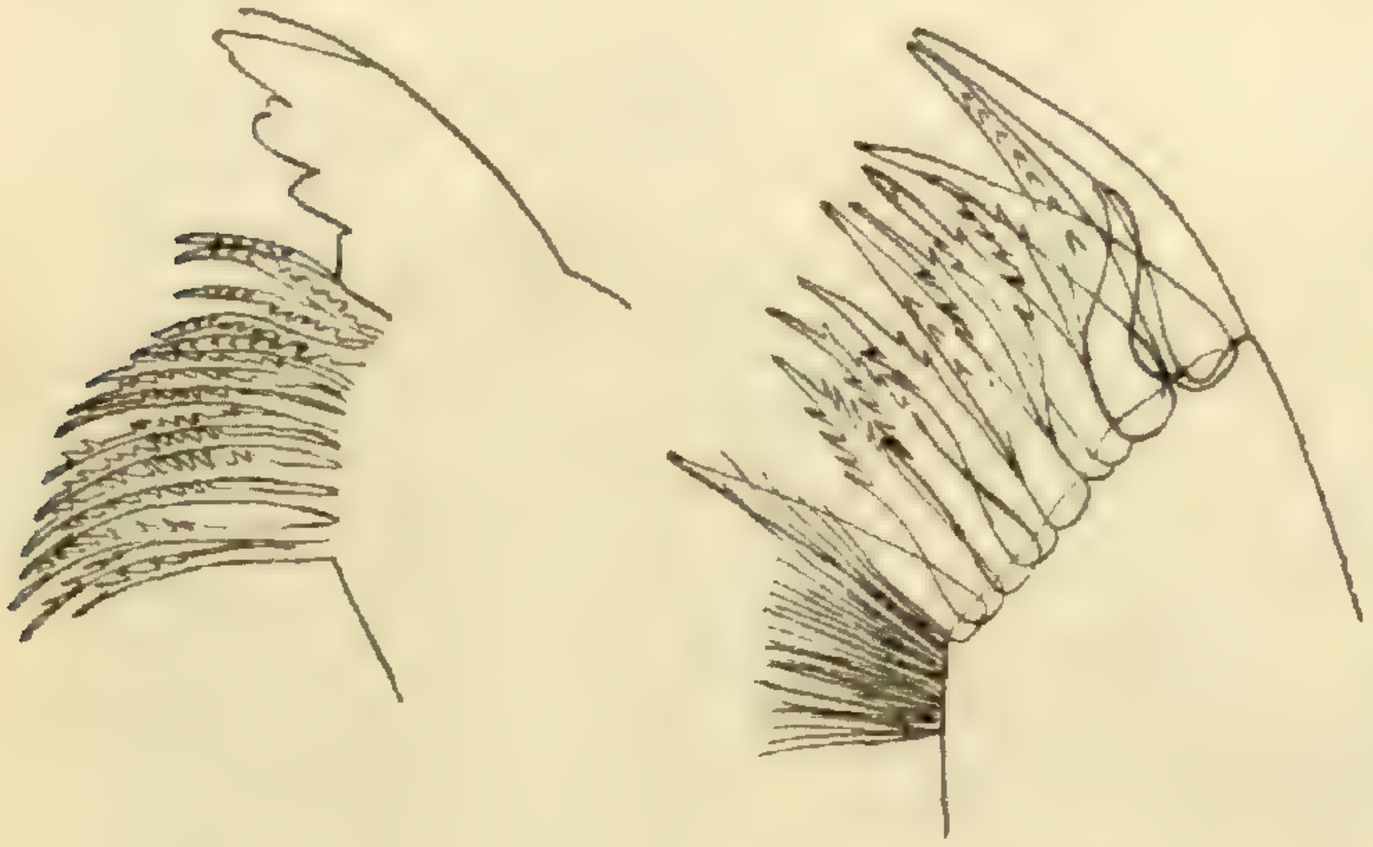
in *M. typica*. The uropoda (fig. 7, U.) are half as long as the caudal segment; the second joint 4 times as long as the first.

Lenght 8 mm. The colour is (in alcohol) black-brown, except the caudal segment, which has no colour and is pellucid.

Fig. 7. ***Munneurycope Tjalfiensis.***

Though *M. Tjalfiensis* is known but from a single, very imperfect specimen, it may be seen, that it is very closely allied to *M. longicornis*, *M. Murrayi* and a third species not mentioned above, viz. *M. oceanica* Tattersall (Fisheries, Ireland, Sci. Invest. 1904,

pt. 2, (1905) p. 23, 72, Pl. 5, figs. 1—7, and Tattersall, Nordisches Plankton vol. 6, Lief. 14, 1911, p. 187, figs. 1—7), whilst it is very different from *M. typica*. The form of the body, the mandibles and the natatory legs which (probably) have the same form as in the genus *Eurycope*, are such essential differences from *Munnopsis*, that it seems to me necessary to establish a separate genus for it, for which I propose the generic name *Munneurycope*. This genus besides comprises the 3 species *M. longicornis* H. J. Hansen, *M. Murrayi* Walker, and *M. oceanica* Tattersall. I can-



Md. Mx. 1

Fig. 8. *Munneurycope Tjalfiensis.* Cutting edge of Md. and Mx. 1.

not agree with Tattersall who is of opinion (l. c. 1904 (1905), p. 24) that all these species belong to the genus *Munnopsis* G. O. Sars. How the relationship is to the 3 species of F Beddard in Challenger Report, Isopoda, cannot be decided; but it must be taken for granted that Sars is right, when he says (Account, vol. 2, Isopoda 1900, p. 133) „it is, however. somewhat questionable, if all these species are actually referable to the present genus“ (viz. *Munnopsis*).

81. **Phryxus abdominalis** Kr.

Bopyrus abdominalis	Krøyer,	Naturhist. Tidsskrift, vol. 3, 1840, p. 102-12, 289-99, Pl. 1-2.
—	—	—	in Gaimard, Voyage en Scand., Crust., 1846 (1849?), Pl. 29, fig. 1.
**Phryxus*	—	G. O. Sars,	Account vol. 2, Isop., 1900, p. 215, Pl. 90-91.
—	—	Richardson,	Isop. of N. Am., Bull. U. S. Nat. Museum, No. 54, 1905, p. 500 (ubi litt.), fig. 550-52.
—	—	H. J. Hansen,	V. Grønland 1887, p. 196.

(St. 465) 62° 58′ N, 50° 52′ W, ca. 25 fath., 21—6—1909, 1 spec.
in Spirontocaris turgida.
(St. 179) 69° 29′ N, 55° 26′ W, 116 fath., trawl, 8—8—1908, 3 spec.
in Spirontocaris macilenta.

The species was hitherto not known from *Spiront. macilenta*; Sars (l. c.) mentions as hosts 8 other species of gen. *Spirontocaris* and 3 species of gen. *Pandalus*.

82. **Bopyroides hippolytes** Kr.

Bopyrus Hippolytes Krøyer, Grønlands Amfipoder, Kgl. Danske Vid. Selsk. naturvid.-math. Afh., vol. 7, 1838, p. 306, Pl. 4, fig. 22.
— — — in Gaimard, Voyage en Scand., Crust. 1846 (1849?) Pl. 28, fig. 2.
**Bopyroides* — G. O. Sars, Account vol. 2, Isop., 1900, p. 199, Pl. 84, fig. 2.
— — Richardson, Isop. of N. Am., Bull. U. S. Nat. Mus. No. 54, 1905, p. 567 (ubi litt.), fig. 628-37.
Gyge — H. J. Hansen, V. Grønland 1887, p. 197.

(St. 465) 62° 58′ N, 50° 52′ W, ca. 25 fath., 21—6—1909, 1 spec.
on Spirontocaris polaris.
(St. 100) 66° 44′ N, 56° 08′ W, ca. 175 fath., 5—7—1908, 1 spec.
on Spirontocaris macilenta.

This species like *Phryxus abdominalis* was hitherto not known from *Spiront. macilenta*; Sars (l. c.) mentions as hosts 3 other species of gen. *Spirontocaris*.

Fam. Dajidæ.

The characters for the family see G. O. Sars, Account vol. 2, Isop. 1900, p. 221.

A synopsis of the genera (partly also of the species) is given in Stebbing, A history of Crustacea, Recent Malacostraca, The international scientific series, vol. 74, 1893, p. 398—400. — A short synopsis (with litt.) is given by H. Richardson in Proc. U. S. Nat. Mus. vol. 33, 1908, p. 689 and (without litt.) by Koehler in Bull. Inst. Océangr. Monaco, No. 196, 1911, p. 31—34.

Synopsis of the species (the genera are in chronological order).

1. *Dajus Mysidis* Krøyer, in Gaimard, Voyage en Scand., Crust. 1846 (1849?), Pl. 28, fig. 1—2, Pl. 29, fig. 1.
* — — G. O. Sars, Account vol. 2, Isopoda 1900, Pl. 223. Pl. 93—94.
— — Richardson, Monograph of Isop. N. Am., Bull. U. S. Nat. Mus. No. 54, 1905, p. 573 (ubi litt.), fig. 638.

In the marsupium of *Mysis oculata* or *M. mixta;* arctic, length 4 mm.

2. *Dajus Siriellæ* G. O. Sars, Challenger Report, Zool. vol. 13, 1885, Schizop., p. 220—21, Pl. 38, fig. 12—14. »Attached to the ventral face of the trunk posteriorly on a few specimens of *Siriella Thomsoni* Milne Edwards, both males and females, in the latter lying partly within the marsupial pouch, as was also the case with *Dajus Mysidis*.«

3. *Aspidophryxus peltatus* G. O. Sars, Oversigt af Norges Crust. I, Vid. Selsk. Forhandl., Christiania 1882, p. 72, Pl. 2, fig. 12—15.
* — — G. O. Sars, Account vol. 2, Isop. 1900, p. 228. Pl. 96.
— — Tattersall, Fisheries, Ireland, Sci. Invest. 1904, pt. 1 (1905), p. 76, 82.
— — — Nordisches Plankton, vol. 6, 1911 (Lief. 14), p. 244, fig. 139—44, p. 290, fig. 283—87.
— *Sarsii* Giard & Bonnier, Epicarides de la fam. des Dajidæ. Bull. Scient. France et Belgique, 1889, p. 266.

Length 3 mm. On the carapace of *Erythrops* or (seldom) *Mysidopsis didelphys* or *Parerythrops obesa.* Norway (Sars). Scotland (Scott), Ireland (Tattersall). Dr. Th. Mortensen has taken the species on *Erythrops* (*pygmæa?*), Kristineberg zool. St. (Gulmarfjord, Bohuslän), 60 m., 11—1—1910.

4. *Aspidophryxus frontalis* Bonnier, in Koehler: Isop. nouveaux de la fam. des Dajides. Bull. Inst Océanogr. No. 196, Monaco 1911, p. 2—10, fig. 1—7. — The larva: Tattersall: Nordisches Plankton, vol. 6, 1911 (Lief. 14.), p. 291, fig. 288—93.

Length 1,4 m. On rostrum of *Siriella norvegica*, 34° N, 8° 10′ W, surface.

5. *Notophryxus ovoides* G. O. Sars, Oversigt af Norges Crust. I, Vid. Selsk. Forh., Christiania, 1882, p. 71, Pl. 2, fig. 9—11.
* — — G. O. Sars, Account vol. 2, Isop. 1900, p. 226, Pl. 95.
— — Tattersall, Nordisches Plankton, vol. 6 (Lief. 14). 1911, p. 252, fig. 156—61, p. 266, fig. 192.

Length 3,5 mm., on the abdomen of *Amblyops abbreviata*, Norway.

6. *Notophryxus lateralis* G. O. Sars, Challenger Report. Zool., vol. 13. 1885, Schizopoda, p. 220, Pl. 38, fig. 9—10. On the gills of *Nematoscelis megalops*, South Atlantic.

7. **Notophryxus clypeatus* G. O. Sars. Norske Nordhavs-Exp., Crust. 1, 1885, p. 137, Pl. 11, fig. 30—33.

Leptophryxus clypeatus G. O. Sars. Crust. et Pycnog. nova. Prodromus, Archiv f. Mathemat. og Naturvid., Kristiania 1879. p. 436. Length 5 mm.; on the dorsal surface of the carapace of *Pseudomma roseum*, W. Norway (63° 10′ N, 5° 0′ E, 763 m.).

? *Notophryxus sp. (N. clypeatus* G. O. Sars?) Tattersall, Isop., Fisheries, Ireland, Sci. Invest. 1904, pt. 2 (1905), p. 76. On *Pseudomma roseum*, S. W. Ireland.

8. **Notophryxus globularis* G. O. Sars, Challenger Report, Zool., vol. 13, Schizopoda, p. 220, Pl. 38, fig. 11.

— — Tattersall, Nordisches Plankton, vol. 6, 1911 (Lief. 14), p. 255, fig. 164.

On the dorsal surface of the carapace of *Thysanoëssa gregaria*, North Pacific.

9. **Heterophryxus appendiculatus* G. O. Sars, Challenger Report, Zool. vol. 13, Schizop., 1885, p. 220, Pl. 38, fig. 8.

**H. app.* Tattersall, Isop., Fisheries, Ireland, Sci. Invest. 1904, pt. 2, (1905), p. 77, Pl. 11, fig. 1—4.

H. app. Tattersall, Nordisches Plankton, vol. 6, Lief. 14, 1911, p. 247. fig. 146—49.

On *Euphausia pellucida* (and *E. Mülleri?*). Cape Verde-Isles (Sars), Mediterranean (Lo-Bianco), Bay of Biscay (Fowler). W. Ireland (47° 14′ N, 7° 58′ W, Tattersall).

10. *Branchiophryxus nyctiphanæ* Caullery, Zool. Anzeiger vol. 20, 1897. p. 88, fig. 1—2. — A short report in Journ. Royal Microsc. Soc. London 1897, pt. 3, p. 204.

Length 1,4—2 mm. On the gills of *Meganyctiphanes norvegica*. Golfe de Gascogne.

11. *Branchiophryxus Caulleryi* Koehler, Isop. nouveaux de la fam. des Dajides, Bull. Inst. Océanogr. Monaco, No. 196, 1911, p. 26—30, fig. 18—21.

Length 0.72 mm. On gills of *Stylecheiron longicorne*.

12. *Prodajus lobiancoi* Bonnier, in Lo Bianco: Le pesche abissali esseguite de F. A. Krupp col yacht Puritan nelle adiacente di Capri ed in altre località del Mediterraneo. Mitt. Zool. Stat. Neapel, vol. 16, 1903, p. 260 (no fig.).

Pr. lob. Bonnier, Comptes Rendus Séances Acad., Paris, vol. 136, 1903. p. 103 (no fig.).

Prodajus lobiancoi Tattersall, Nordisches Plankton, vol. 6, Lief. 14, 1911, p. 249.

Length 2 mm. In the marsupium(?) of *Gastrosaccus Normani*, Mediterranean.

13. **Prodajus ostendensis* Gilson, Bull. sc. France et Belgique, tome 43, 1909, p. 19—92, Pl. 1—2.

**P. ost.* H. J. Hansen, Vid. Medd. Nat. Foren. Kbhv. 1909 (1910), p. 221—24, Pl. 3, fig. 3, Pl. 4, Pl. 5, fig. 1.

P. ost. Tattersall, Nordisches Plankton, vol. 6, Lief. 14, 1911, p. 250, fig. 150—55, p. 265, fig. 190—91.

Length 3,5 mm. In the marsupium of *Gastrosaccus spinifer*, North Sea.

14. *Zonophryxus retrodens* Richardson, U. S. Fish Commission Bull., 1903, p. 51—52, fig. 4—5.

Length 11,5 mm. Hawaiian Islands. Host unknown.

15. *Zonophryxus trilobus* Richardson, Department of commerce and labor, Bureau of fisheries; document No. 736, Washington 1910, p. 41, fig. 39.

Length 14 mm. Philippine Islands. Host unknown.

16. *Zonophryxus Grimaldii* Koehler, Bull. Inst. Océanogr. Monaco, No. 196, 1911, p. 16—22, fig. 13—14.

Length 16 mm. (immature). 36° 14′ N, 8° 06′ W, Host *Heterocarpus Grimaldii?*

17. **Holophryxus alaskensis* Richardson, U. S. Fish Commission, Bull. vol. 24, 1904 (1905), p. 220—21, fig. 8—10.

H. al. Richardson, Monogr. Isop. N. Am., Bull. U. S. Nat. Mus. No. 54, 1905, p. 576, fig. 639—41.

Length 10 mm. Alaska. Host unknown.

18. **Holophryxus Giardi* Richardson, Proc. U. S. Nat. Mus., vol. 33, 1908, p. 690—92, fig. 1—3.

H. G. Richardson, Proc. U. S. Nat. Mus. vol. 37, 1909 (1910), p. 123.

— — — Department of commerce and labor, Bureau fisheries, document No. 736, Washington 1910, p. 41.

Length 39 mm. On the dorsal surface of the carapace of *Gennadas borealis*. Bering Island, Philippine Islands.

19. **Holophryxus californiensis* Richardson, Proc. U. S. Nat. Mus. vol. 33, 1908, p. 692—94, fig. 4—5.

H. cal. Richardson, Proc. U. S. Nat. Mus. vol. 37, 1909 (1910), p. 123.

Length ca. 20 mm. (?) On the dorsal surface of *Pasiphœa pacifica*. California.

20. *Holophryxus Richardi* Koehler, Bull. Inst. Océanogr. Monaco, No. 196, 1911, p. 23—26, fig. 15—17; — see also No. 83-a., p. 108.
Holophryxus sp. (H. Richardi Koehler?) see No. 83-b., p. 109.

21. *Holophryxus Acanthephyræ* n. sp., see Nr. 84, p. 112.

22. *Arthrophryxus beringianus* Richardson, Proc. U. S. Nat. Mus. vol. 33, 1908, p. 694—96, fig. 6—7.
Length 14 mm. On *Eucopia australis*. Bering Island.

23. *Colophryxus novangliæ* Richardson, Proc. U. S. Nat. Mus. vol. 34, 1908, p. 391—92, fig. 1—3.
Length 5 mm. Long Island. Host unknown.

24. *Prophryxus alascensis* Richardson, Proc. U. S. Nat. Mus. vol. 37, 1909 (1910), p. 124, fig. 47—48.
Length 2,3 mm. Alaska. Host unknown (a Schizopod?).

25. *Allophryxus ruber* Koehler, Bull. Inst. Océanogr. Monaco, No. 196, 1911, p. 10—16, fig. 8—12.
Length 6,5 mm. 43° 04′ N, 19° 42′ W, 0—1500 m.; 46° 31′ 20″ N, 5° 13′ W, 0—1750 m. Host unknown.

The male is known in the following species.

Dajus mysidis.
Notophryxus ovoides.
Aspidophryxus peltatus
— *frontalis*
Heterophryxus appendiculatus
Branchiophryxus nyctiphanæ (no fig.)
— *Caulleryi*
Prodajus ostendensis
Zonophryxus retrodens
Holophryxus californiensis
Arthrophryxus beringianus
Colophryxus novangliæ
Allophryxus ruber

The larva is known in the following species.

Dajus Mysidis
Notophryxus ovoides
Aspidophryxus peltatus
— *frontalis*
Branchiophryxus nyctiphanæ (no fig.)
— *Caulleryi*
Prodajus ostendensis
Holophryxus Acanthephyræ (see p. 115, fig. 19—21.)

Besides these H. J. Hansen in Ergebnisse d. Plankton-Exp. d. Humboldt-Stiftung, vol. 2, G, c, 1895, p. 22—27 and p. 45—46, Pl. 2, figs. 3—6, Pl. 3, figs. 1—2, has described 6 larvæ of unknown species and states that Dr. v. Schab has two not-described larvæ from the Guinea-coast.

83a. **Holophryxus Richardi** Koehler (figs. 9—10).

Holophryxus Richardi Koehler, Isop. nouveaux de la fam. des Dajides provenant des campagnes de la „Princesse Alice“, Bull. Inst. Océanogr. Monaco, No. 196, 1911. p. 23—26, figs. 15—17.

(St. 363) 66° 21′ N, 57° 04′ W, 680 m., 800 m. wire, 18—5—1909. 1 ♀

At the station mentioned above the „Tjalfe“ has taken a specimen of *Holophryxus Richardi*. The specimen from the „Tjalfe“ is about $2^1/_2$ times longer than that of Koehler (l. c.) viz. 9 mm. long and 4 mm. broad. Though on account of the difference in size there are

Fig. 9.

Holophryxus Richardi.
Ventral view.

Fig. 10.

Holophryxus Richardi.
Dorsal view (a little from the left) and lateral view (from the rigth).

great differences, it is evident that the two specimens belong to the same species, as may especially be concluded from the form of the appendages on the 5th pair of incubatory plates (oostégites). A detailed description I find superfluous, as all, that I have been able to see, may be seen from my figs; and a close examination was impossible, as I had but one single specimen; for this reason I cannot render a nearer account of the antennæ and the oral parts.

1st antenna seems to have 2 joints. Also 2nd antenna seems to be two-jointed, but is much bigger; on the 1st joint a little bud-like process may be seen. The oral parts are not visible, not even the tip of the mandibles, which generally project a little. There are 5 pairs of incubatory plates; but what seems to be the third pair is the 4th, the third pair being concealed by the 4th. The 5th pair have in the hind part a crest, on the left plate with 8, on the right plate with 6 teeth; such crests are also to be found in the other specimens of the genus *Holophryxus* from the „Tjalfe" (No. 83b and 84), but are not described in any other species. The left incubatory plate of 5th pair is, as shown in the fig., divided into two lappets, which seems to be caused by accidental molestation.

The colour is (in alcohol) pale yellow.

Neither the male nor ova were found.

The host is unknown. A specimen of *Eusirus Holmii* (No. 68) is the sole Crustacean brought home from this station, and though it was not probable that a Dajid should be a parasite on an Amphipod, I have closely examined this specimen, but it has no traces showing that it has been the host of the parasite. But from the journal it may be seen, that at the stat. mentioned were taken a Mysid (probably *Boreomysis microps*), *Gennadas elegans* and *Sergestes arcticus*; all these animals not being preserved I have not been able to find the host; for the rest see the next species, No. 83b!

83b. **Holophryxus sp.** (**H. Richardi** Koehler?) (figs. 11—14 [13 partly]).

(St. 346) 64° 22′ N, 56° 00′ W, 400—800 m. wire, 10—5—1909. 1 ♀ on **Sergestes arcticus.**

From this stat. the „Tjalfe" has brought home a *Holophryxus*, 14 mm. long, 5,5 mm. broad. The form is the same as in the other species of the genus, but somewhat more lengthened.

Articulation of the antennæ is not visible; but the tip of the mandibles may be seen to project a little. Only 3 pairs

of incubatory plates are visible, viz. 2nd, 4th and 5th pairs; close to the hind edge of the 5th pair a pair of little acuminated appendages are to be seen, and on the hind edge of the right plate (but not on the left) a little bud-like prominence may further be seen. Each of the crests on the 5th pair of plates seems to have 12 teeth. The 5th pair of plates are very large and contiguous in the middle line; this I cannot understand otherwise than that the animal is mature, though it has no ova. — Ova or ♂ were not found.

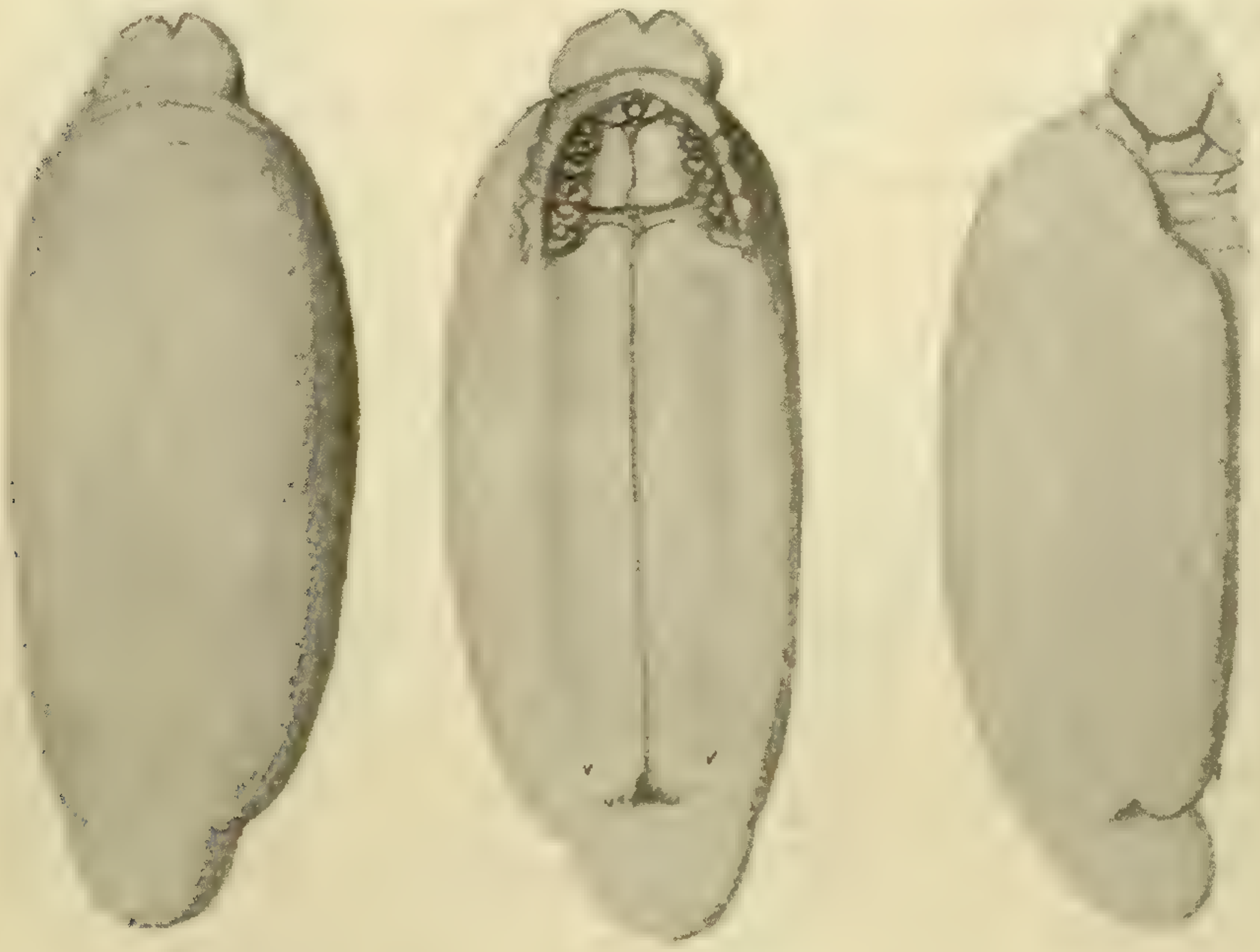


Fig. 11. *Holophryxus (Richardi?).*
Dorsal, ventral and lateral view.

The colour is (in alcohol) pale-yellow.

The appendages on the 5th pair of incubatory plates I apprehend as showing that this specimen is the fully grown female of *H. Richardi,* and this I base on the following. (For the sake of convenience I call Koehler's specimen stage 1, the two others (from the „Tjalfe" St. 363 and 346) stage 2 and 3).

1. The cephalon projects in stage 3 still more than in stage 2, stage 1 has in front of the cephalon a broad projecting part, formed partly by the first pair of coxal plates. In stage 2 the cephalon only projects a little beyond the projecting part. In stage

3 the cephalon is more distinctly bilobate than in stage 2; in stage 1 the cephalon is rounded without any trace of a furrow.

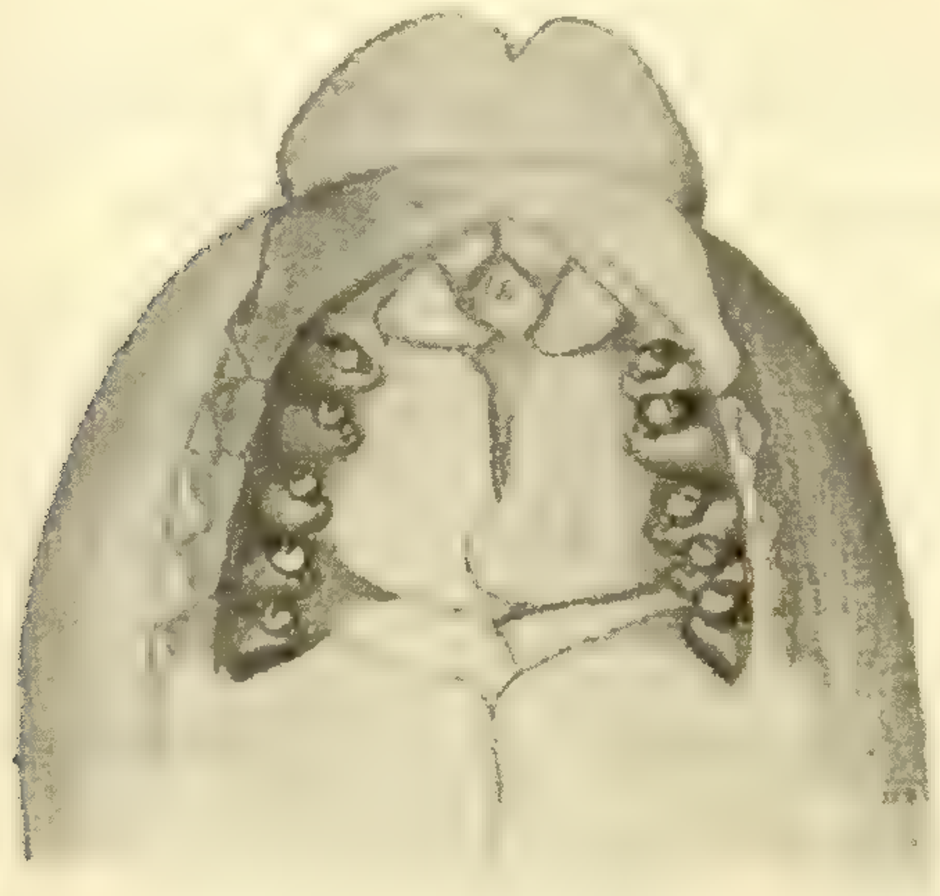


Fig. 12. *Holophryxus (Richardi?).* The oral area.

2. The size of the specimens is enlarged (stage 1 3,7 mm. long, stage 2 9 mm., stage 3 14 mm.), but the relative breadth is diminished (stage 1 2:3,7 mm. = 1 : 1,85; stage 2 4 : 9 mm. = 1 : 2,25; stage 3 14 : 5,5 mm. = 1 : 2,55).

3. Each species of Dajidæ has, as far as we know, only one single species as host (excluding *Dajus Mysidis)*, and here the host probably in all 3 cases was *Sergestes arcticus*. Stage 1 was taken 33° 41′ N, 36° 55′ W, 0—2500 m., thus in the territory of distribution of *Sergestes arcticus* (see H. J. Hansen, Ingolf 1908, p. 82); stage 2 was taken together with *Sergestes*, and stage 3 was found fixed to *Sergestes*.

Fig. 13. *Holophryxus Acanthephyræ* on *Acanthephyra purpurea* (above) and *Holophryxus (Richardi?)* on *Sergestes arcticus* (below).

The 3 specimens giving thus together a very distinct series of development, I think there is no doubt that they all belong to the same species.

The relation to the host is not mentioned for any Dajid; the authors only mention the place, where the parasite is fixed. The specimen from the „Tjalfe“ St. 346 was, as shown in figs. 13—14, fixed on the hind part of the dorsal surface of the carapace of the *Sergestes* with the cephalon turned towards the abdomen of the host, just as H. Richardson has figured *Holophryxus Giardi* and *H. californiensis*. The carapace of the *Sergestes* has dark holes from the mouth and pereiopoda of the parasite (see fig. 14); also it may be seen, that the *Holophryxus* has removed its legs 2 or 3 times (together with its growth?).

Fig. 14.
Hindpart of the carapace of *Sergestes arcticus* with the marks of the mouth and pereiopoda of *Holophryxus* (*Richardi?*).

As the parasite is fixed quite superficially to the host, some very interesting questions arise. Does the parasite only live as long as the time between two castings of the skin of the host? Does it prevent the host from casting the skin? — To answer these questions is quite impossible at the present moment.

84. **Holophryxus Acanthephyræ** n. sp. (fig. 13 [partly], 15—21).

(St. 322) 60° 07′ N, 48° 26′ W, 2000 m. wire, 3—5—1909, 1 spec. (♀) on Acanthephyra purpurea.

As I have had but one single specimen, a closer examination and dissection was not possible; therefore the following description can not give all details.

Length 22 mm., breadth 12,5 mm.

The specimen is very like *H. californiensis* from California (H. Richardson, Proc. U. S. Nat. Mus. vol. 33, 1908, p. 692—94, figs. 4—5). From Miss Richardson's very short description and her indistinct photographic fig. it cannot with security be determ-

ined, that the specimen from the „Tjalfe“ is not *H. californiensis*, and moreover I have no male. But the circumstance, that the host belongs to quite another genus (*H. calif.* lives on *Pasiphæa pacifica*), and that the locality besides is W. of America, seems to me to prove, that the specimen from the „Tjalfe“ is a new species.

The form is ovate and somewhat skew, the left side being a little longer than the right. The cephalon cannot be seen from below; it is very small and has a little longitudinal furrow, but is

Fig. 15.

Holophryxus Acanthephyræ. Dorsal, ventral and lateral view.

not really bilobated; at each side of the cephalon there is a little rounded prominence. On the dorsal surface of the thorax just behind the cephalon 2 transversal furrows are visible; otherwise there is no trace of segmentation of the thorax (seen dorsally) exclusive of the existence of 4 longitudinal streaks on the dorsal surface, somewhat recalling the segmentation of the abdomen in the Paguridæ. The abdomen projects from the thorax as in the other species. The coxal plates are the sole true trace of segmentation. There are 5 pairs of coxal plates corresponding with the 5 pairs of pereiopods; the 4 first pairs are separated from the thorax by a seam, and the two plates of the first pair are connected by a frontal margin lying under the cephalon and forming the anterior boundary

of the oral area. There are very slight seams between the coxal plates exclusive of those between the two last pairs; the fifth pair are very small.

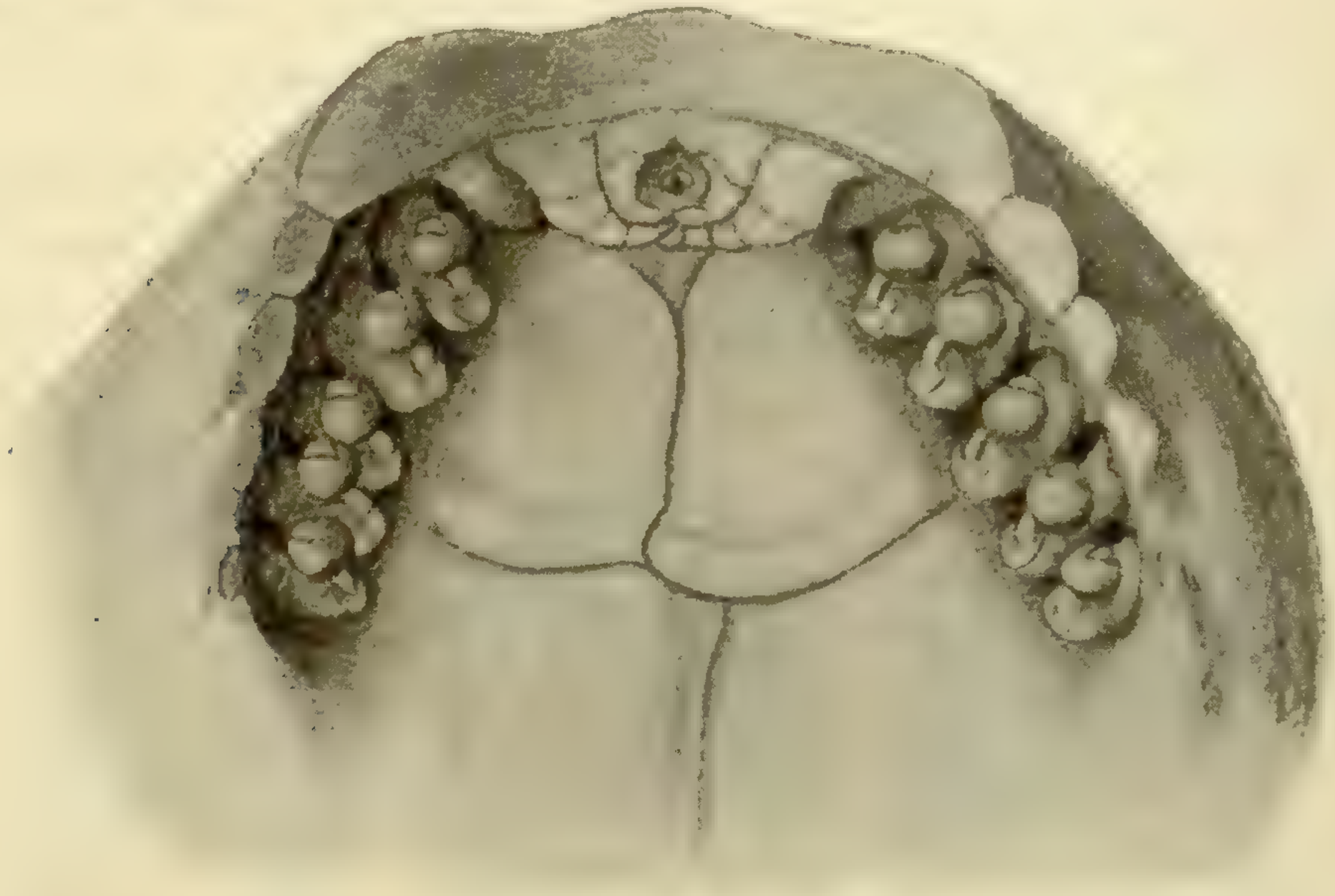


Fig. 16. *Holophryxus Acanthephyræ.* The oral area.

The ventral surface is, exclusive of the hindpart, somewhat concave. The oral area with the pereiopods is rather small and about semicircular. The antennæ seem to be articulated, the first

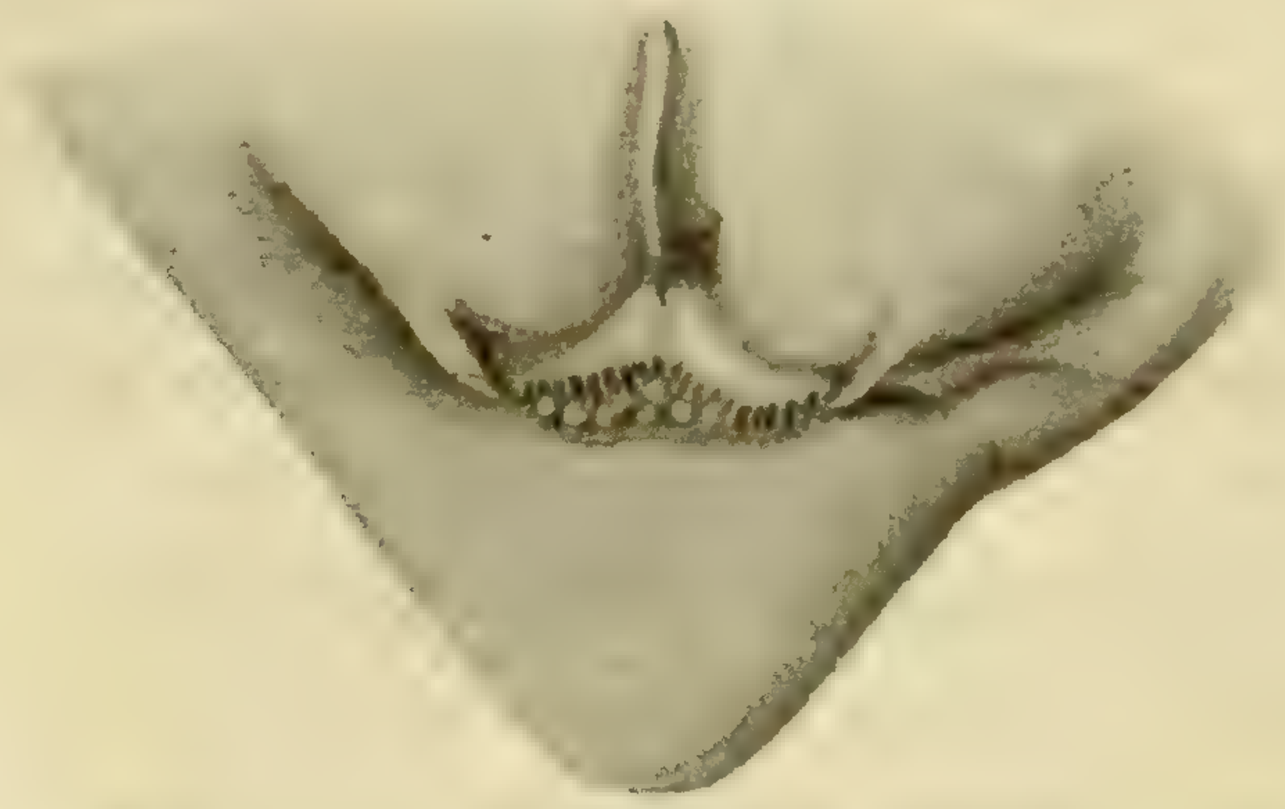


Fig. 17. *Holophryxus Acanthephyræ.*
Hind part from below.

pair in 3, the second pair in 5 joints; but it is not excluded that the apparent articulation is in reality simple folds. Between the antennæ the tip of the mandibles is visible. The gnathopod lies

between antenna 2 and the first pereiopod and is quite unarticulated. The 5 pairs of pereiopods have about the same form as those in *Zonophryxus Grimaldii* (Koehler, Bull. Inst. Océanogr., Monaco No. 196, 1911, fig. 13, p. 17); they seem to have but 5 joints, and the 4th joint is quite globular. Only two pairs of incubatory plates are visible, and it has been impossible without dissection to examine if there are more plates. The hind-plates have the usual crest, each with about 14 teeth; inside the teeth some embryos are visible. The abdomen has no traces either of segmentation or of pleopods or uropods.

The colour is (in alcohol) reddish brown spotted with yellow.

The specimen was fixed to the host (see fig. 13) quite as *Holophryxus* sp. (No. 83 b), but somewhat obliquely towards the right side of the host; there was a large spot as trace of the mouth of the parasite, and it may be seen, that this has changed its place 4—5 times.

Fig. 18.
Holophryxus Acanthephyræ.
The marks of the mouth and pereiopoda, and the carapace of *Acanthephyra* with these marks.

No male was found.

The space within the incubatory plates is quite filled with embryos. These are pale-yellow, 0,2 mm. long. On account of the colour a closer examination of the larvæ was impossible without special preparation. But Prof. H. F. Jungersen who has a great experience in preparatory-methods, has kindly prepared for me some specimens with potash and pyrogallic acid; for this I owe him my best thanks, for otherwise I would not have been able to give good figures with all details.

The larvæ are very like partly those of *Dajus Mysidis* (G. O. Sars, Account vol. 2, Pl. 94, larva), partly those of *Clypeoniscus Meinertii* (Giard et Bonnier, Bull. Scientifique France et Belgique, vol. 25, 1893. p. 421; Richardson, Monograph of Isopoda N.-America,

Bull. U. S. Nat.-Mus., No. 54, 1905, figs. p. 580). The body is curved ventrally and consists of cephalon and 12 segments. There is no trace of an eye. The 1st antenna is small, short, bud-like,

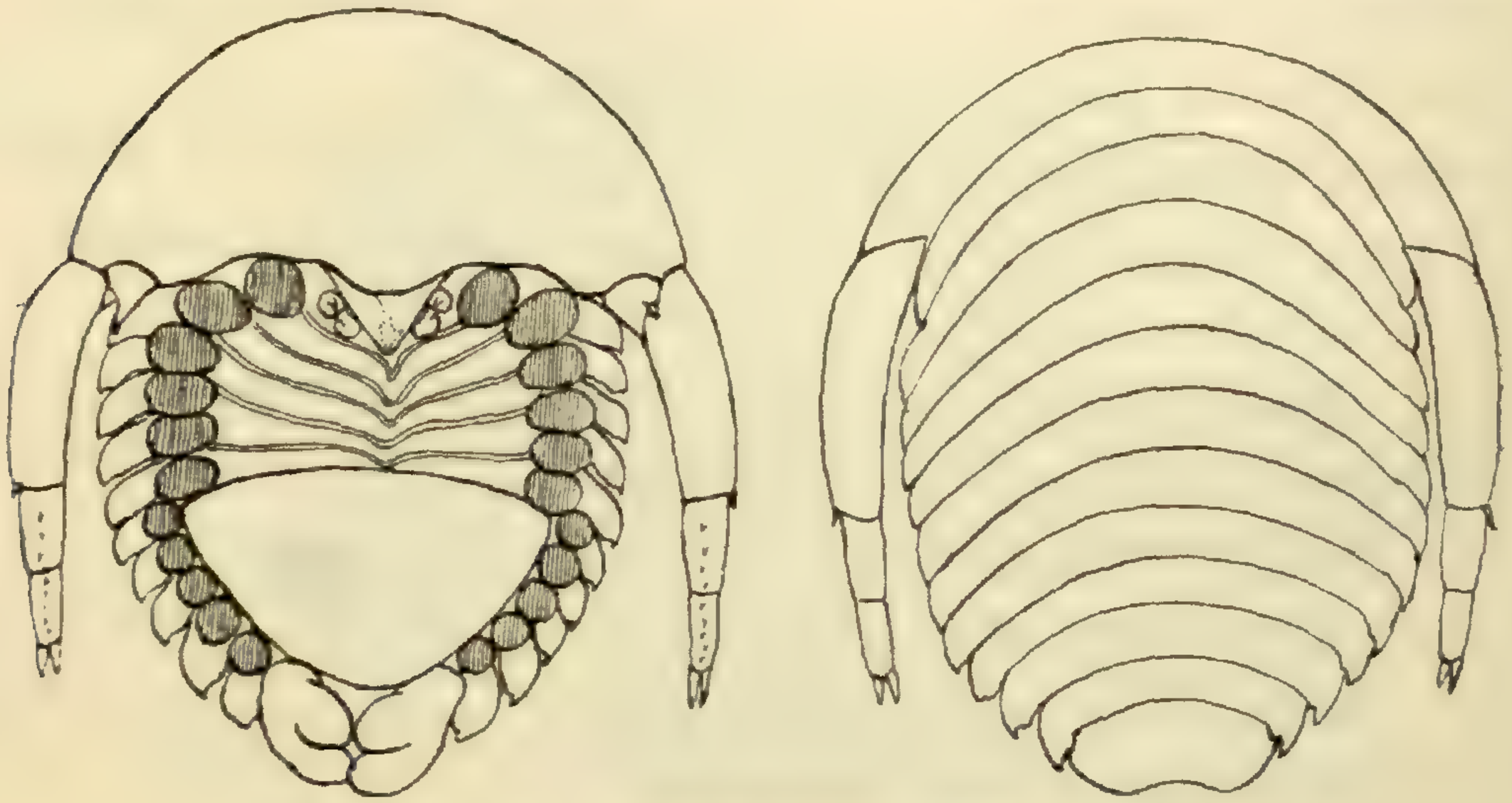


Fig. 19. *Holophryxus Acanthephyræ*, larva.
Ventral and dorsal view. The pereiopoda and pleopoda are removed (the shaded parts).

apically acuminated and with a spine on the outerside. 2nd antenna is about as long as the body, three-articulated, and has some small spines (see the fig.). Through the oral cone the mandibles are visible. At each side of the oral cone a gnathopod is seen of about the same form as the pereiopoda of the adult animal. Gnathopoda of this form are to be found in the Cryptoniscian-stages of the Dajidæ, but they are never found in other larvæ of Dajidæ of the stage figured; this does not prove that they do not exist in the other known larvæ, but they are, even with the excellent preparation made by

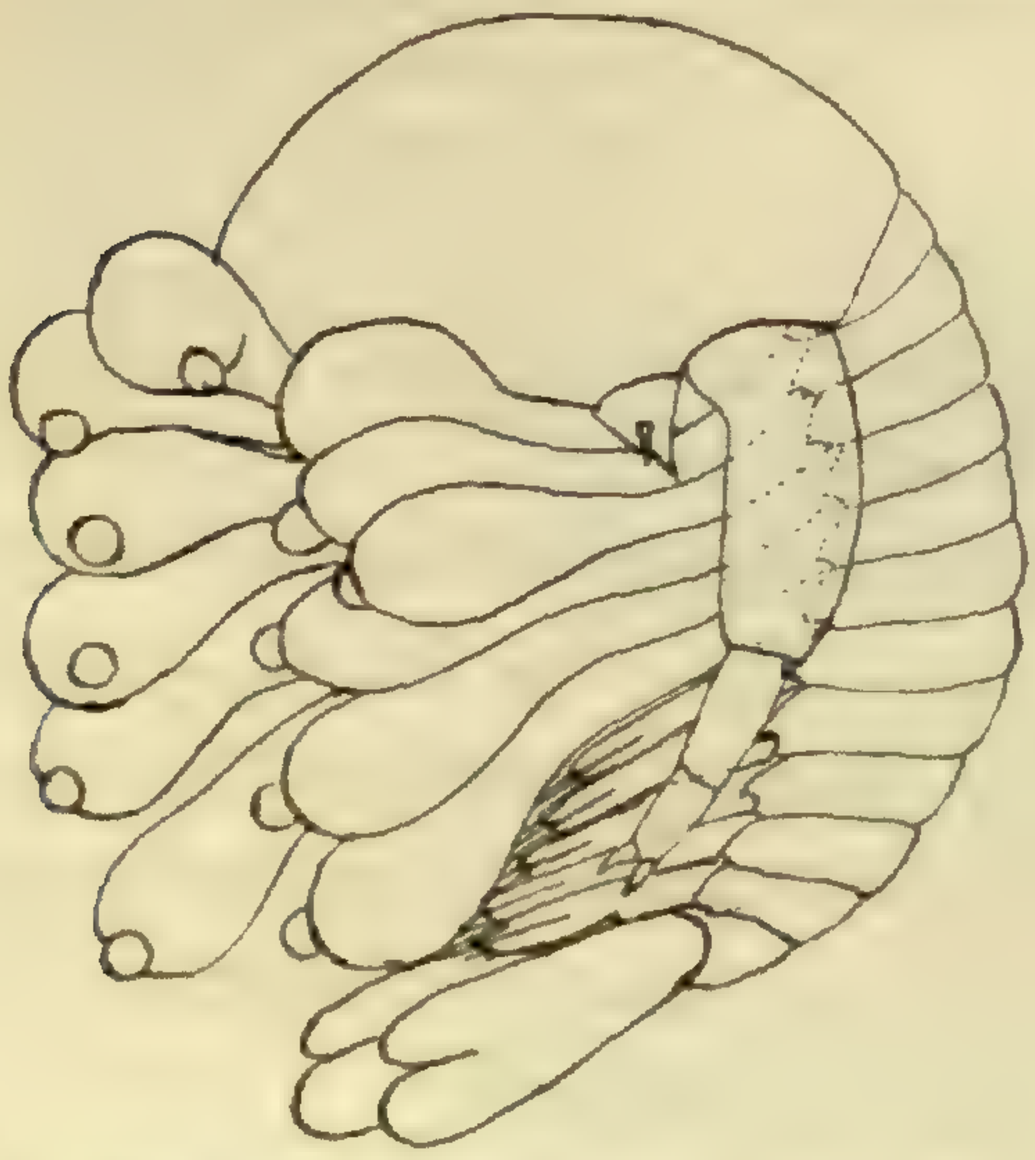


Fig. 20. *Holophryxus Acanthephyræ*, larva. Lateral view a little from below.

Prof. Jungersen, very difffcult to see. — The ventral surface has 6 lamellæ (one for each of the 6 pairs of pereiopoda) and a large scutum (on the abdomen). The pereiopoda are thick and apparently immobile; on the innerside close to the tip they have a little bud-like process. When made transparent the pereiopoda of the next larval stage are to be seen through the skin, and within the bud-like process a claw is seen, quite as in the adult animal (fig. 21). There are 5 pairs of cleft pleopoda; they have a constriction about midway and are perhaps 2-articulated; but the articulation is not distinct. They have rather long natatory setæ. The uropoda are cleft, unarticulated and have no setæ.

Fig. 21. *Holophryxus Acanthephyræ.* larva. A pereiopod.

It has been found unnecessary to give a longer description, all details being seen from the figs.

Larvæ of a Decapod (Pandalus propinquus?) (figs. 22—31).

(St. 30b) 63° 04′ N, 56° 32′ W, 70 m. wire, 7—6—1908, ca. 15 spec. (1. and 2. stage).
(St. 37b) 63° 47′ N, 52° 12′ W, 100 m. wire, 9—6—1908, 2 spec. (2. stage).
(St. 229) 64° 20′ N, 53° 03′ W, 120, 100 and 80 m. wire, 29—8—1908, ca. 10 spec. (5. stage).
(St. 423) 65° 03′ N, 54° 16′ W, 120, 100 and 80 m. wire, 7—6—1909, ca. 60 spec. (25 spec. 2. stage, 35 spec. 3. stage).
(St. 196d) 68° 40′ N, 53° 12′ W, 350 m. wire, 17—8—1908, ca. 40 spec. (4. stage).
(St. 124) 69° 17′ N, 52° 14′ W, 150 m. wire, 16—7—1908, ca. 25 spec. (2. and 3. stage).

1.st (known) larval stage (figs. 22—30, st. I).

The total length 7 mm.

The body is very slender. The carapace inclusive of the rostrum is about one third as long as the total length. Rostrum is half as long as the carapace; it is slender and spiniform, without any denticles. In the middle of the dorsal surface of the carapace there is a little blunt prominence; the antero-lateral corners are apically pointed. The posterior division of the body has 6 seg-

ments and gradually tapers distally. The abdominal segments have no dentition exclusive of telson. Telson has the usual form and

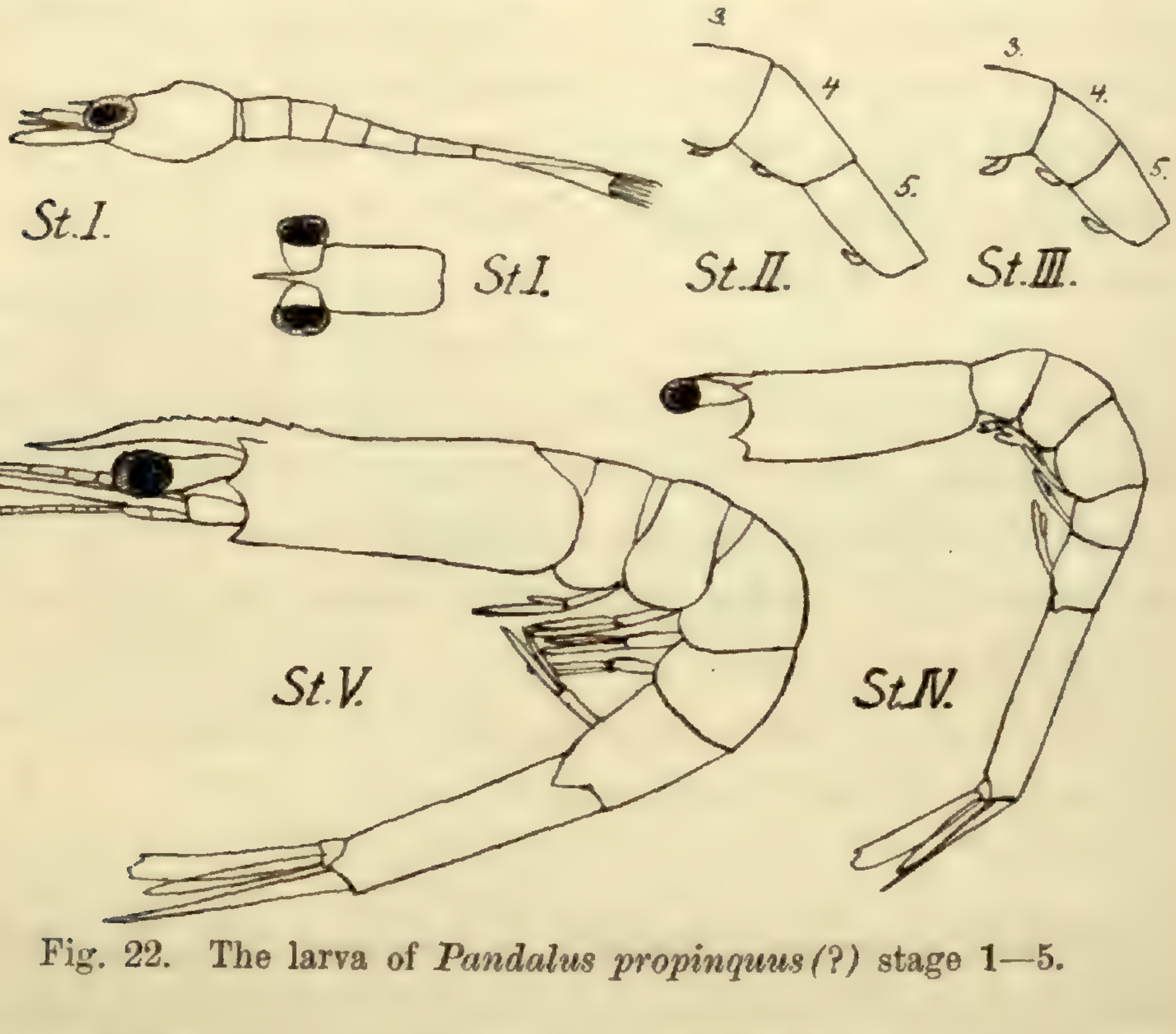


Fig. 22. The larva of *Pandalus propinquus (?)* stage 1—5.

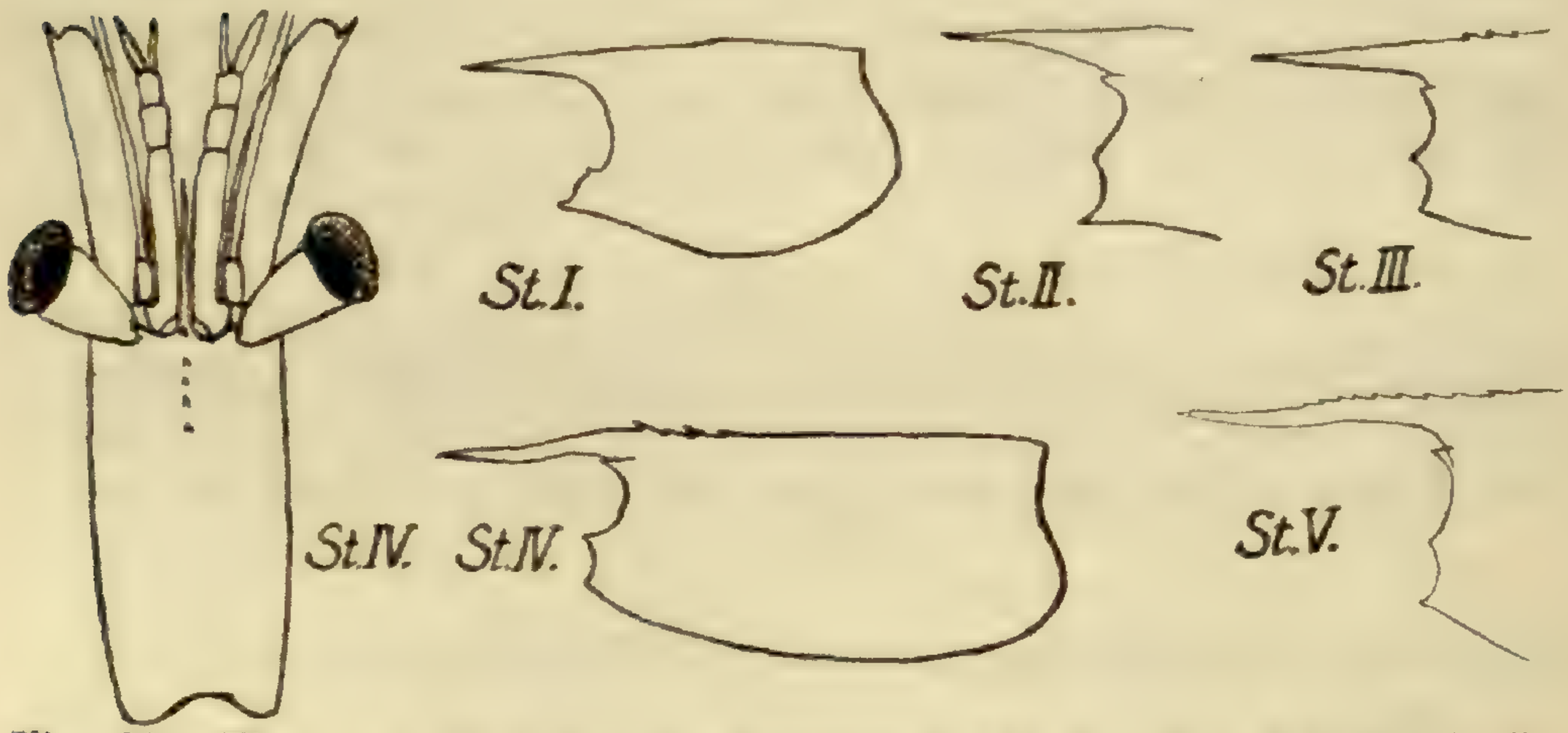


Fig. 23. The larva of *Pandalus propinquus (?)*: carapace of stage 1—5.

is deeply emarginated at the hind edge with the usual 7 pairs of spines; all the spines are somewhat broken apically. Through the skin the incipient formation of the uropoda may be seen.

The eyes are somewhat applanated; they surpass somewhat the sides of the carapace.

All the appendages exclusive of the pleopoda and uropoda are present. The 1st and 2nd antennæ have about the same form as in the 1st larval stage of *Pandalus borealis* (G. O. Sars: Account of the postembryonal development of *Pandalus borealis* . . . .; Report

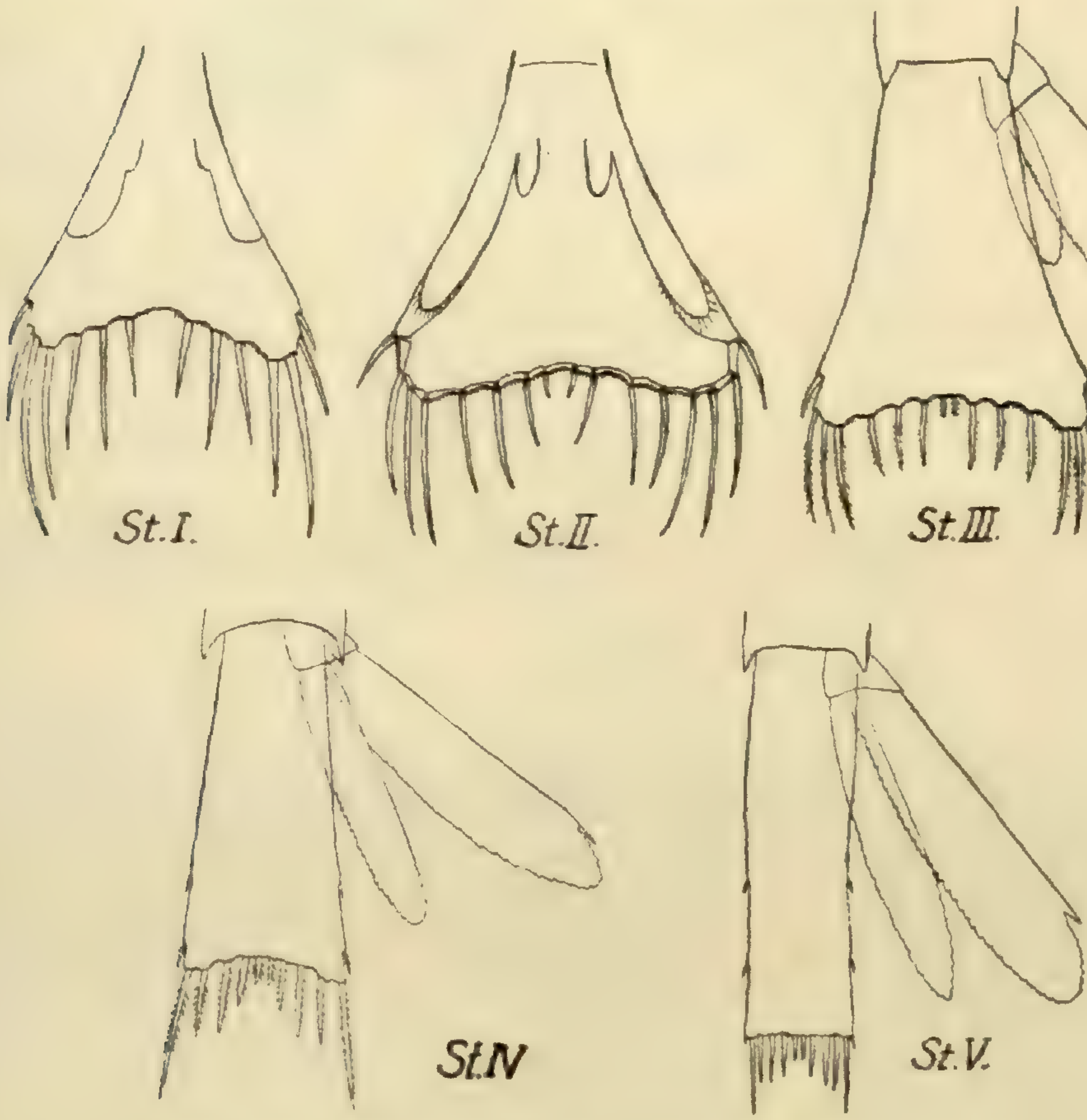


Fig. 24. The larva of *Pandalus propinquus (?)*: telson and uropoda of stage 1—5.

on Norwegian Fishery- and Marine-Investigations, vol. 1, 1900, No. 3, Pl. 1, figs. 3—4); the most important difference is that the stem of 1st antenna has a little joint apically. Also the mandibles and the maxillæ have about the same form (Sars l. c., Pl. 1, figs. 6—7); through the skin the mandibles and 2nd maxillæ of the next stage may be seen. The same agreement will be found in regard to 1st and 2nd maxilliped (Sars l. c. figs. 10—12); but 3rd maxilliped has the usual form and is not dilated as in *Pandalus borealis* (Sars l. c. fig. 12); besides it has 7 joints. (1. stage

of *P. borealis* has but 4 joints). The greatest difference, however, obtains in regard to the pereiopods. All the pereiopods are rather

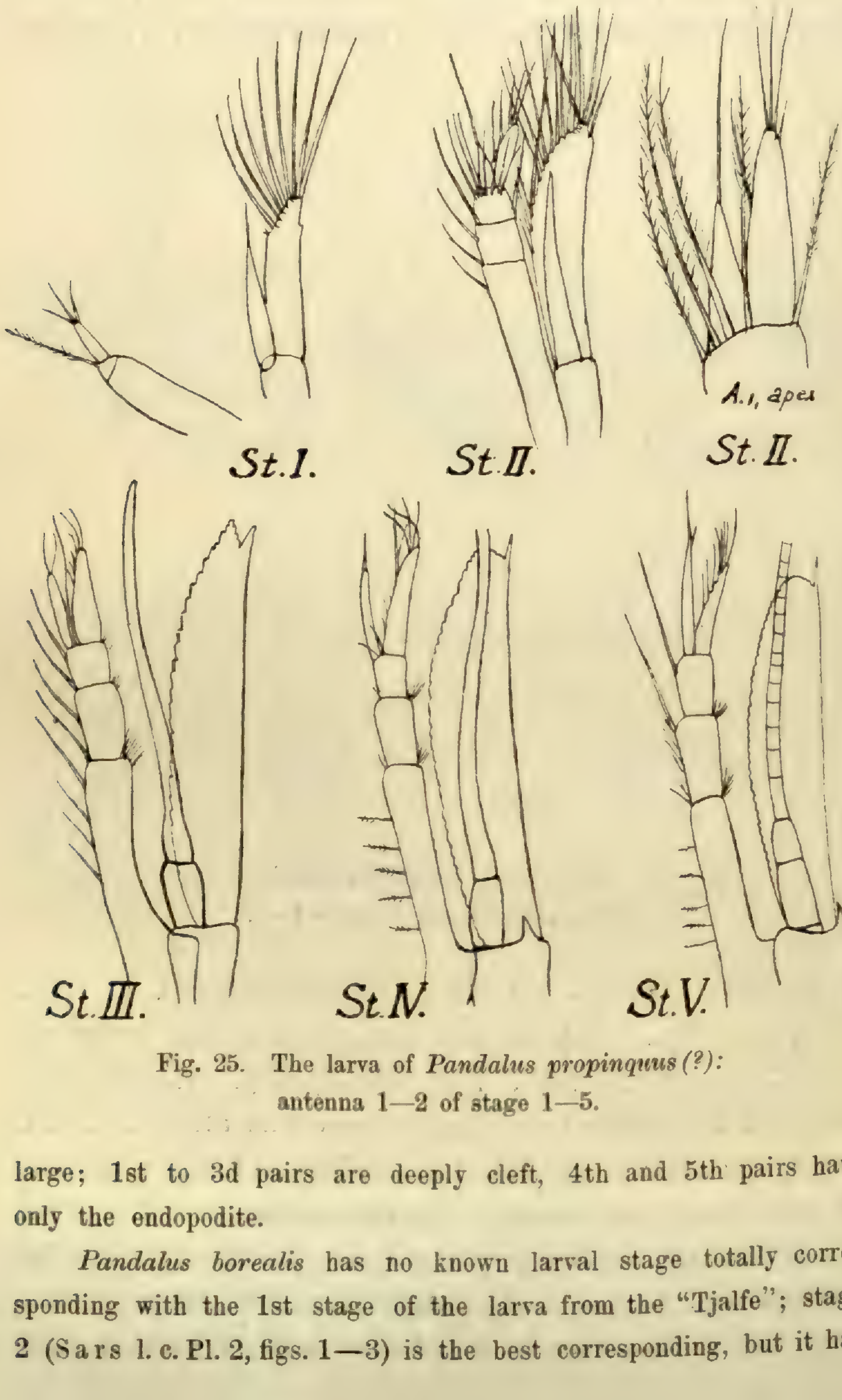


Fig. 25. The larva of *Pandalus propinquus (?)*:
antenna 1—2 of stage 1—5.

large; 1st to 3d pairs are deeply cleft, 4th and 5th pairs have only the endopodite.

Pandalus borealis has no known larval stage totally corresponding with the 1st stage of the larva from the "Tjalfe"; stage 2 (Sars l. c. Pl. 2, figs. 1—3) is the best corresponding, but it has

no traces of 3rd to 5th pereiopod, and 2nd pereiopod is but a little, bud-like body.

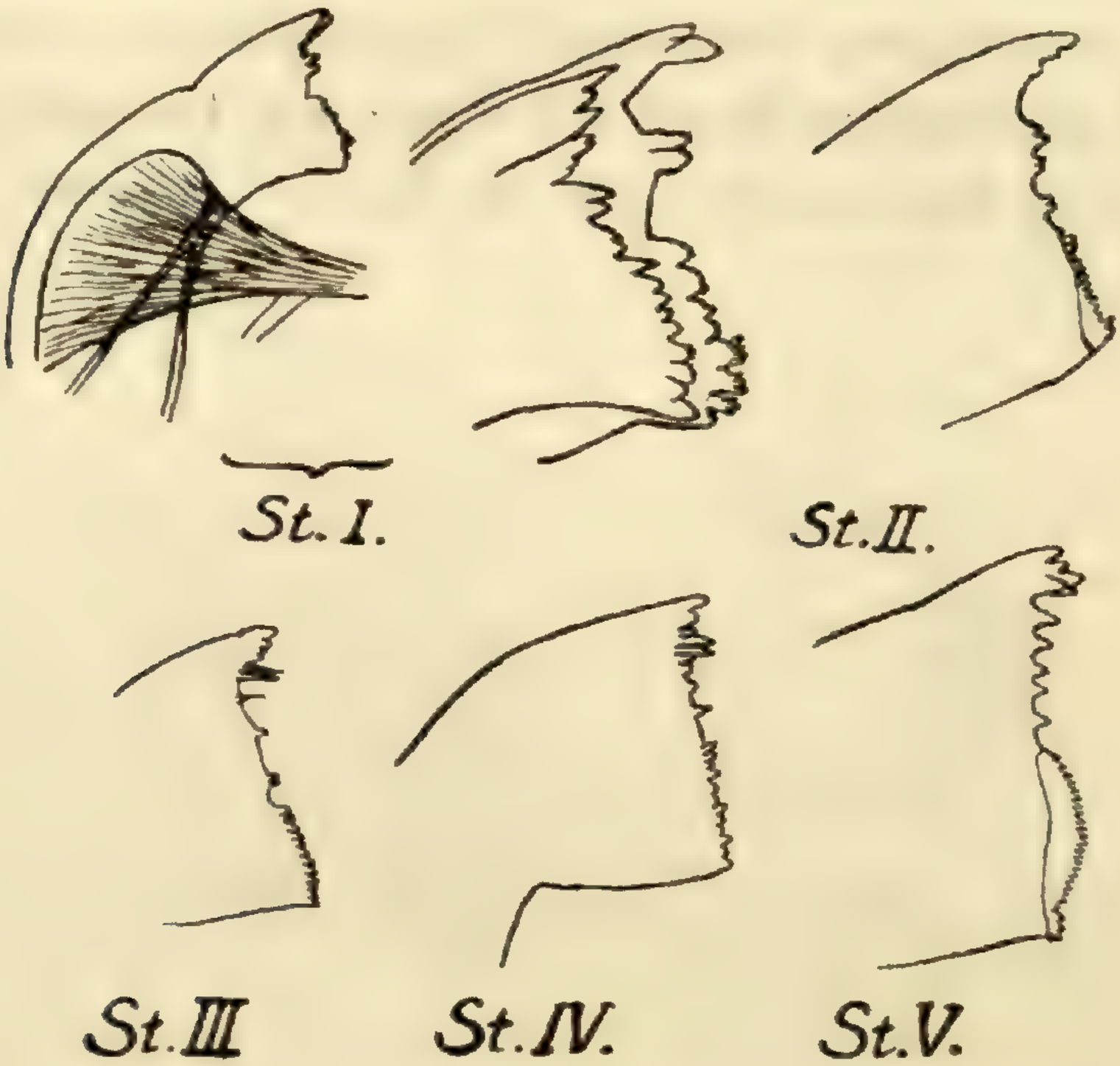


Fig. 26. The larva of *Pandalus propinquus (?)*: the mandible of stage 1—5.

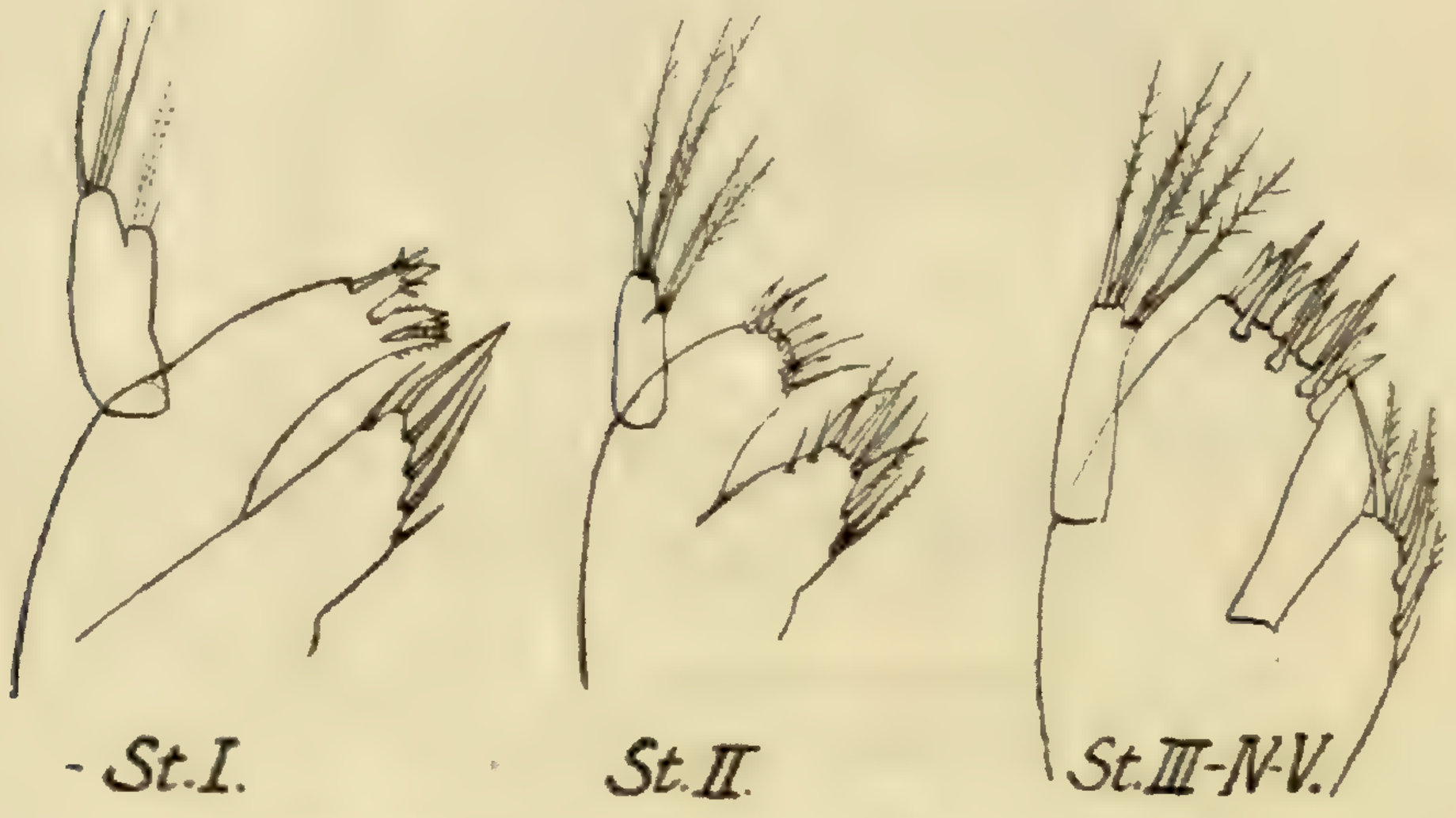


Fig. 27. The larva of *Pandalus propinquus (?)*: 1. max. of stage 1—5.

2nd (known) larval stage (figs. 22—30, st. II).

Total length 9 mm.

The carapace has obtained one supra-ocular tooth. Through the larval skin the incipient formation of the articulation between the

6th abdominal segment and the telson may be seen as also the now cleft uropoda. The telson has now 8 pairs of spines.

The 1st antenna has acquired 3 joints in the stem. The oral parts are about as in the 1st stage; but 1st—3rd pereiopod have now all the usual 7 joints (in the 1st stage they are un-

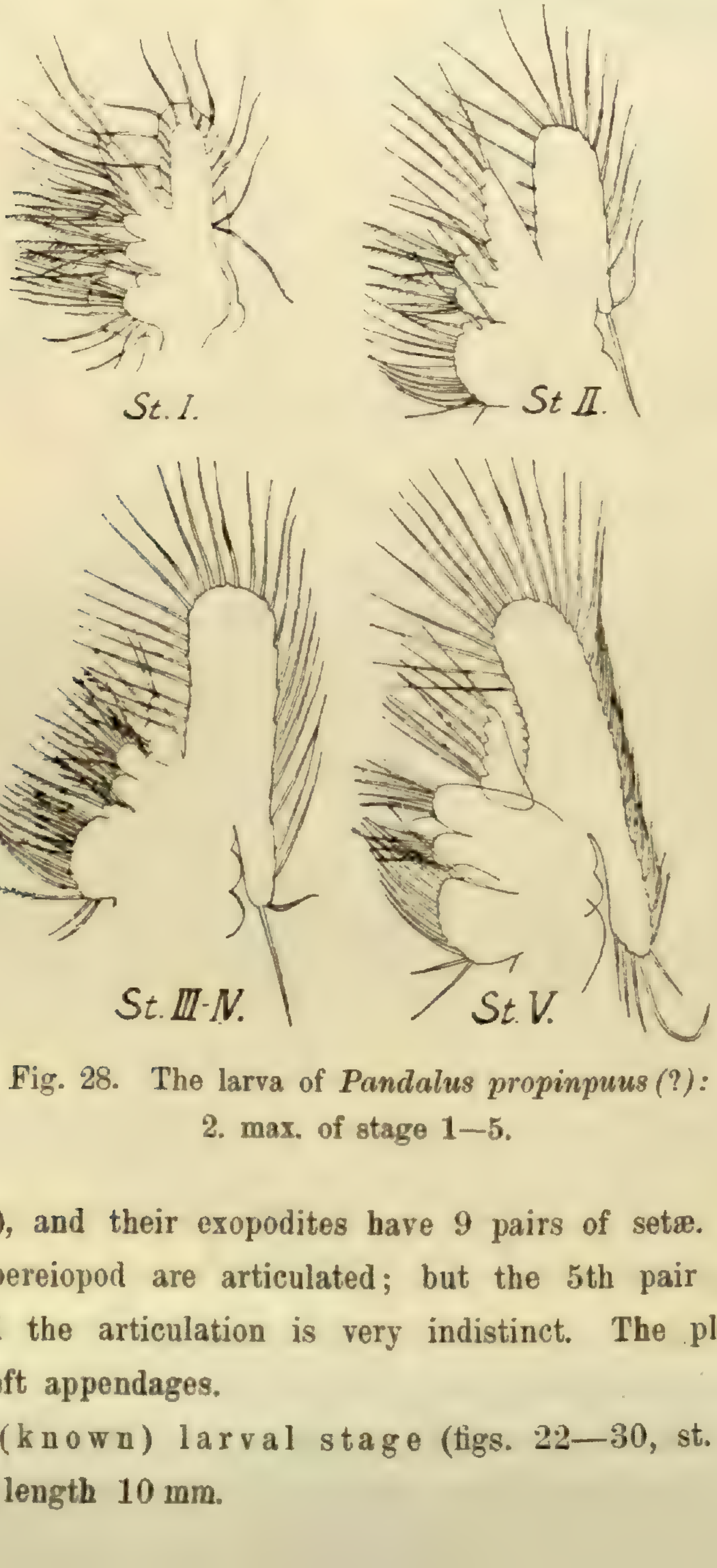


Fig. 28. The larva of *Pandalus propinpuus (?)*:
2. max. of stage 1—5.

articulated), and their exopodites have 9 pairs of setæ. Also 4th and 5th pereiopod are articulated; but the 5th pair has but 6 joints, and the articulation is very indistinct. The pleopods are little uncleft appendages.

3rd (known) larval stage (figs. 22—30, st. III).

Total length 10 mm.

In the fore-part of the middle-line of the carapace there are 3 little teeth; but they are not to be found in all the specimens. 1st antenna is unaltered, but flagellum in 2nd antenna is longer than the squama, though this is considerably increased in length, and the peduncular part (of the flagellum) is well defined, but has only a single joint; the terminal part is still unarticulated. The oral parts are about unaltered. The pereiopods are somewhat lengthened; 2nd pair are now cheliform, and 5th pair have 7 distinct joints. Abdomen has 7 joints, and the uropoda are free.

4th (known) stage (figs. 22—31, st. IV).

Total length 12 mm.

The carapace has 4 teeth in the middle line. The 5th abdominal segment has a little tooth at each side of the hind edge. The telson is very much altered; it is in the distal part not much broader than in the forepart, and it has but 7 pairs of spines, the 2 pairs of which are placed at the side-edge.

The antennæ and the oral parts are about as in the preceding stage; but in 2nd maxilla the exopodite is much more developed, especially its hinder lappet. The exopodites of the pereiopoda have 10 pairs of setæ, and the pereiopoda are somewhat lengthened in comparison with the preceding stage. The pleopoda are now cleft, but have a trace of articulation. The endopodites of the uropoda are about as long as the exopodites.

5th (known) stage (figs. 22—31, st. V).

Total length 19 mm.

The rostrum has 11 teeth, 1 of which is but a little from the tip and 3—4 on the carapace. The telson is about linear, has 8 pairs of spines, and is not emarginate at the tip.

In the 2nd antenna the peduncular part of the flagellum has 2 joints, and the flagellum itself is unarticulated, but is somewhat damaged in all the specimens. The oral parts are about as in the preceding stage. The pereiopoda are still more lengthened than in the 4th stage, and the 4th—5th pairs are very like the

same legs in the 1st postlarval stage in *Pandalus borealis* (Sars l. c., Pl. 1, fig. 1). The pleopoda are now articulated.

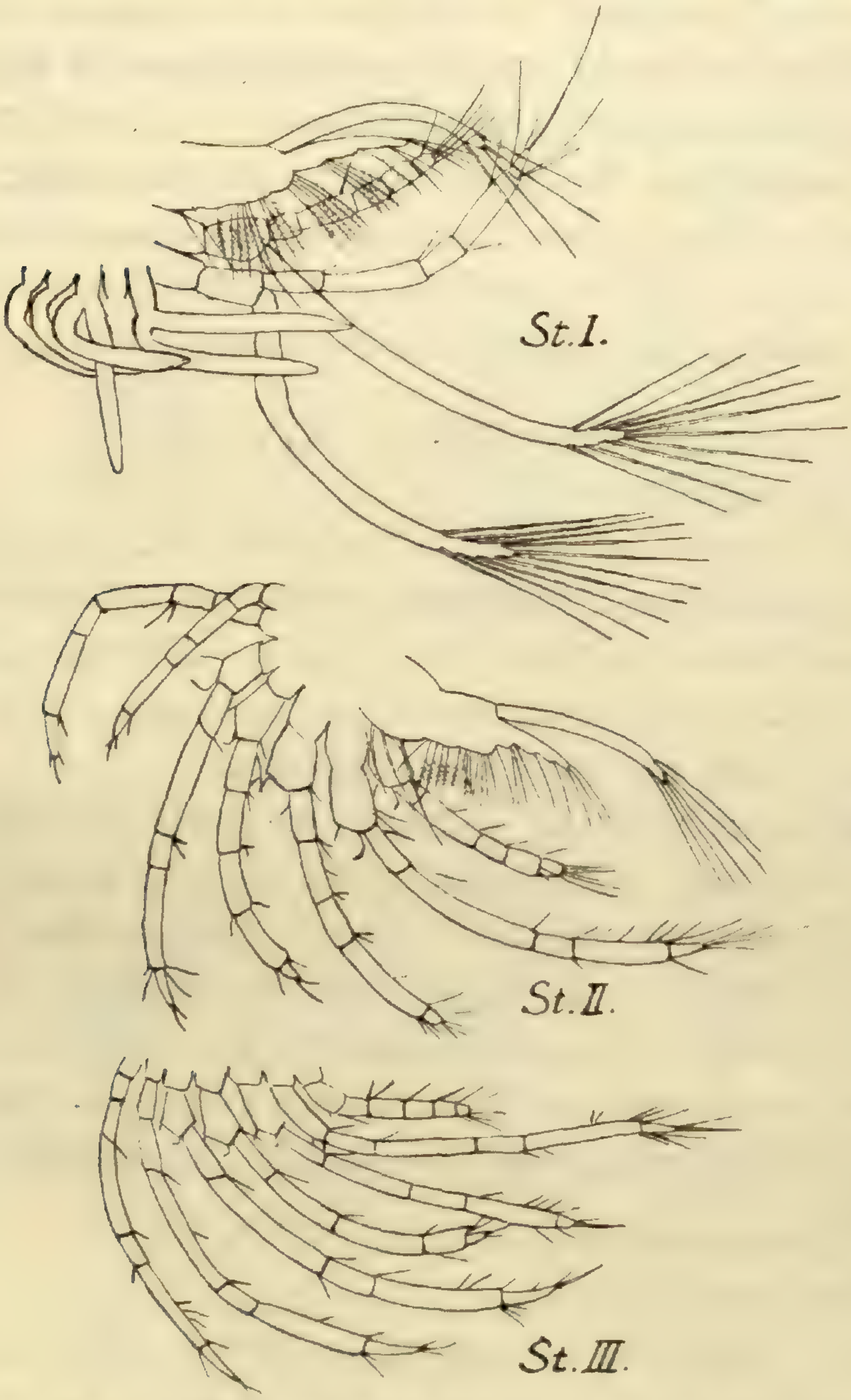


Fig. 29. The larva of *Pandalus propinquus (?)*: maxillipedes and pereiopoda of stage 1—3 (in st. 2—3 the exopodites are not drawn with exception of that in mxp. 1).

As may be seen, it is evident, that all the larvæ belong to one species.

From the rostrum and the 1st—2nd pereiopoda in the last

stage it may be concluded, that this species must belong to the fam. *Pandalidæ*, and this fam. has [in the Greenland seas but 3

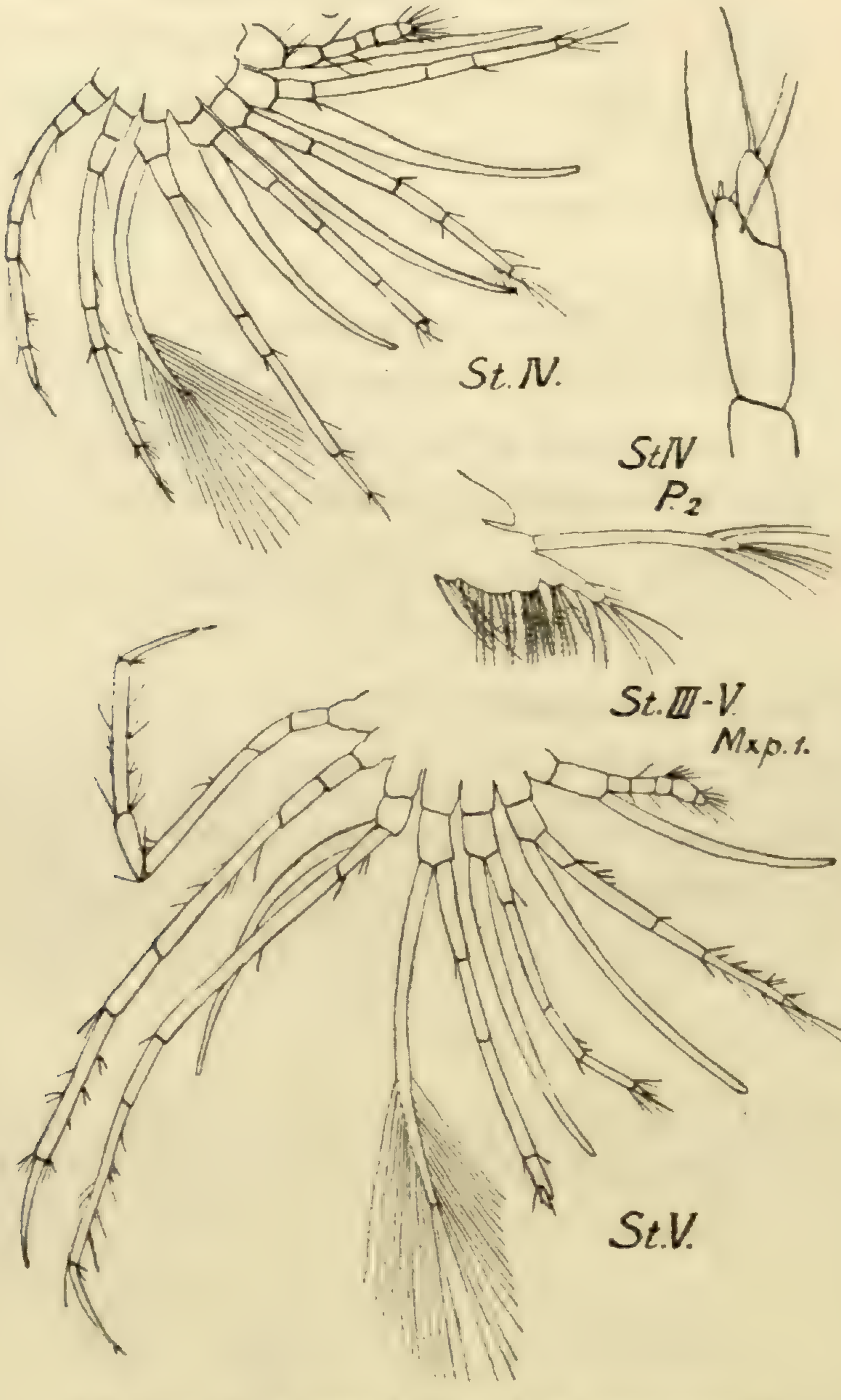


Fig. 30. The larva of *Pandalus propinquus (?)*:
maxillipedes and pereiopoda of stage 4—5.

species, viz. *Pandalus borealis*, *P. Montagui* and *P. propinquus*. The development of the two first-named species is described by G. O. Sars (l. c.); but the development of *P. propinquus* is quite unknown. When compared with the figs. given by Sars the agree-

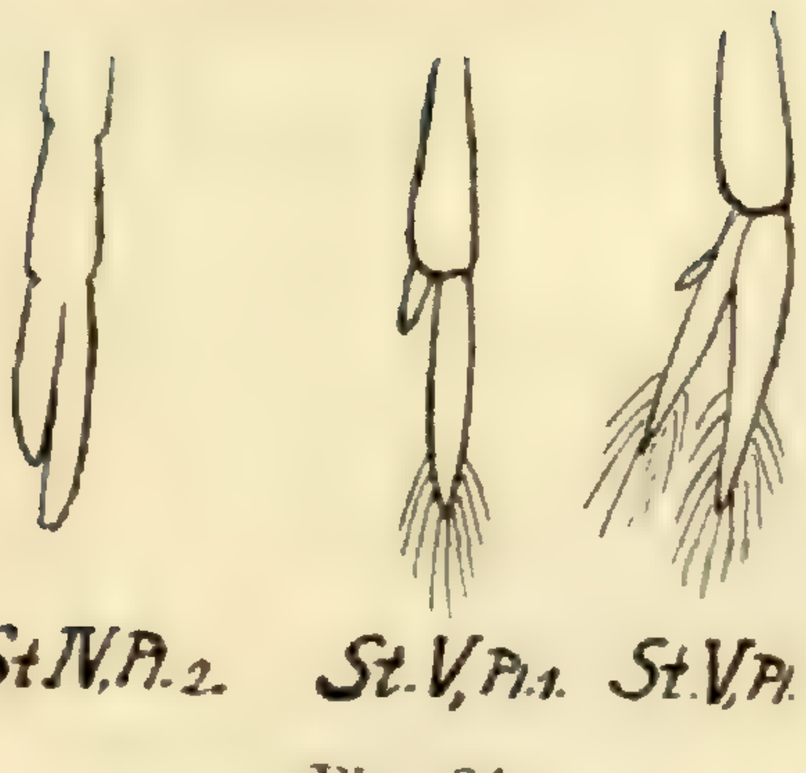


Fig. 31.
The larva of *Pandalus propinquus (?)*: Pleopods of st. 4—5.

ment with the larvæ from the "Tjalfe" is very distinct; the most important discrepancy is that the larvæ from the "Tjalfe" have no exopodite on the 4th pereiopod; *P. borealis* has this exopodite, but from Sars' description it seems, that *P. Montagui* and *P. (Pandalina) brevirostris* never acquire it. As, besides, *P. propinquus* has been taken in the deeper parts of the Davis Strait (by the "Ingolf" and the "Tjalfe"), it seems very probable that the larvæ must belong to this species.

Mysis-stage of a Decapod (Spirontocaris sp.!) (fig. 32).

(St. 465) 62° 58′ N, 50° 52′ W, 25 fath., 21—6—1909, 5 spec.

In "Report on the Malacostraca, Pycnogonida and some Entomostraca collected by the Danmark Expedition to North-East Green-

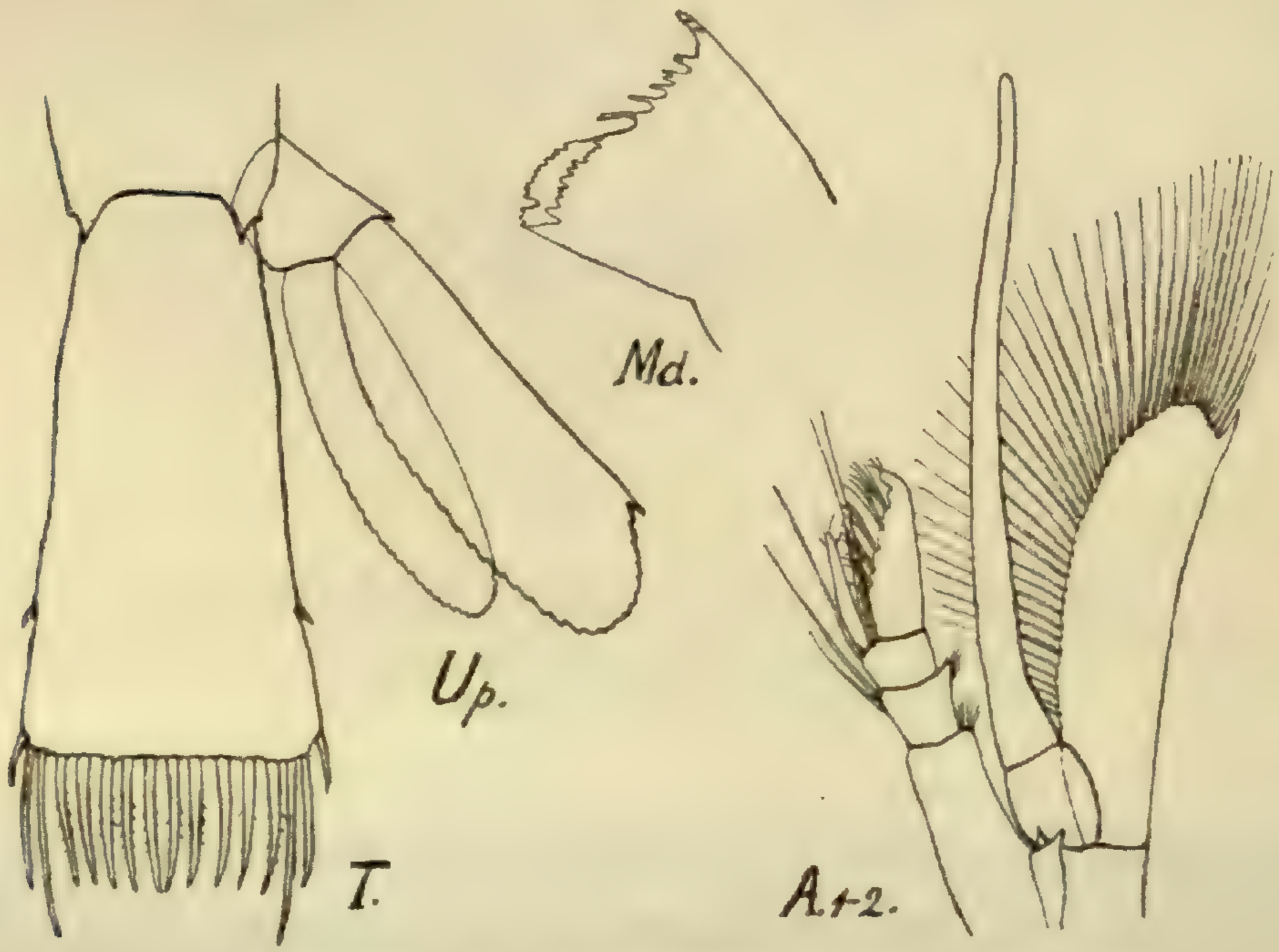


Fig. 32. Larva of *Spirontocaris sp. (?)*.

land", in „Meddelelser om Grønland", vol. 45, 1912, p. 522, Pl. 43, figs. 31—39, I have described a larva taken in Danmarks Havn (ca. 77° N, E. Greenland), 0—20 m., 19—9—1907.

Unfortunately the Danmark Expedition has taken but a single, badly preserved specimen. The specimens from the "Tjalfe" are better preserved and show, that the telson has a little spine at the hind corner. There is a little difference in regard to the mandibles, and the flagellum in the 2nd antenna has no trace of articulation; in all other regards the specimens from the "Tjalfe" fully correspond with that from the Danmark-Expedition. In the specimen figured the uropoda are somewhat shorter than the telson; in the other specimens they have the same length as the telson.

Brachyurid larva, 1st Zoea (fig. 33).

(St. 19a) 58° 41′ N, 49° 44′ W, 100 m. wire, 31—5—1908, 1 spec.
(St. 465) 62° 58′ N, 50° 52′ W, 25 fath., 21—6—1909, many spec. (1 cm.^{3}).
(St. 464) The mouth of the Fiskenæsfjord, 80 m. wire, 21—6—1909. many spec. (50 cm.^{3}).
(St. 30b) 63° 04′ N, 56° 32′ W, 70 m. wire, 7—6—1908, ca. 25 spec.
(St. 37b) 63° 47′ N, 52° 12′ W, 100 m. wire, 9—6—1908. many spec. (5 cm.^{3}).
(St. 196d) 68° 40′ N, 53° 12′ W, 410 m., 350 m. wire, 17—8—1908, 1 spec.
(St. 124) 69° 17′ N, 52° 14′ W, 150 m. wire, 16—7—1908, many spec. (1 cm.^{3}).
(St. 125) — — 550 m. wire, — 1 spec.

At the localities mentioned above the 1st Zoeastage of a crab was taken. The larvæ are in some points very like the larva of *Hyas araneus* (Williamson, Rep. on larval and later stages of certain decapod Crustacea: Fisheries, Scotland, Sci. Invest. 1909, 1. (Decbr. 1910), p. 13—15, Pl. 1, figs. 1—2; Pl. 5, figs. 70—78. 80—81). In other points they are very like the 1st Zoea of *Cancer pagurus* (J. Pearson, Cancer; Transact. Liverpool Biol. Soc., vol. 22, 1908 p. 461, Pl. 13, figs. 85—87); the appendages are in about the same stage of development, and the telson has about the same form and the same number of spines: but the lateral spines of the carapace of the larvæ from the "Tjalfe" are longer, and on the abdominal segments there are lateral spines as in the larvæ of

Hyas araneus (see above) and as in the last zoea-stage of the American species *Cancer irroratus* (S. I. Smith, Metamorph. of lobster and other crust.; U. S. Commission of Fish and Fisheries 1871—72 (1873), p. 530, Pl. 8, fig. 37). Smith does not give

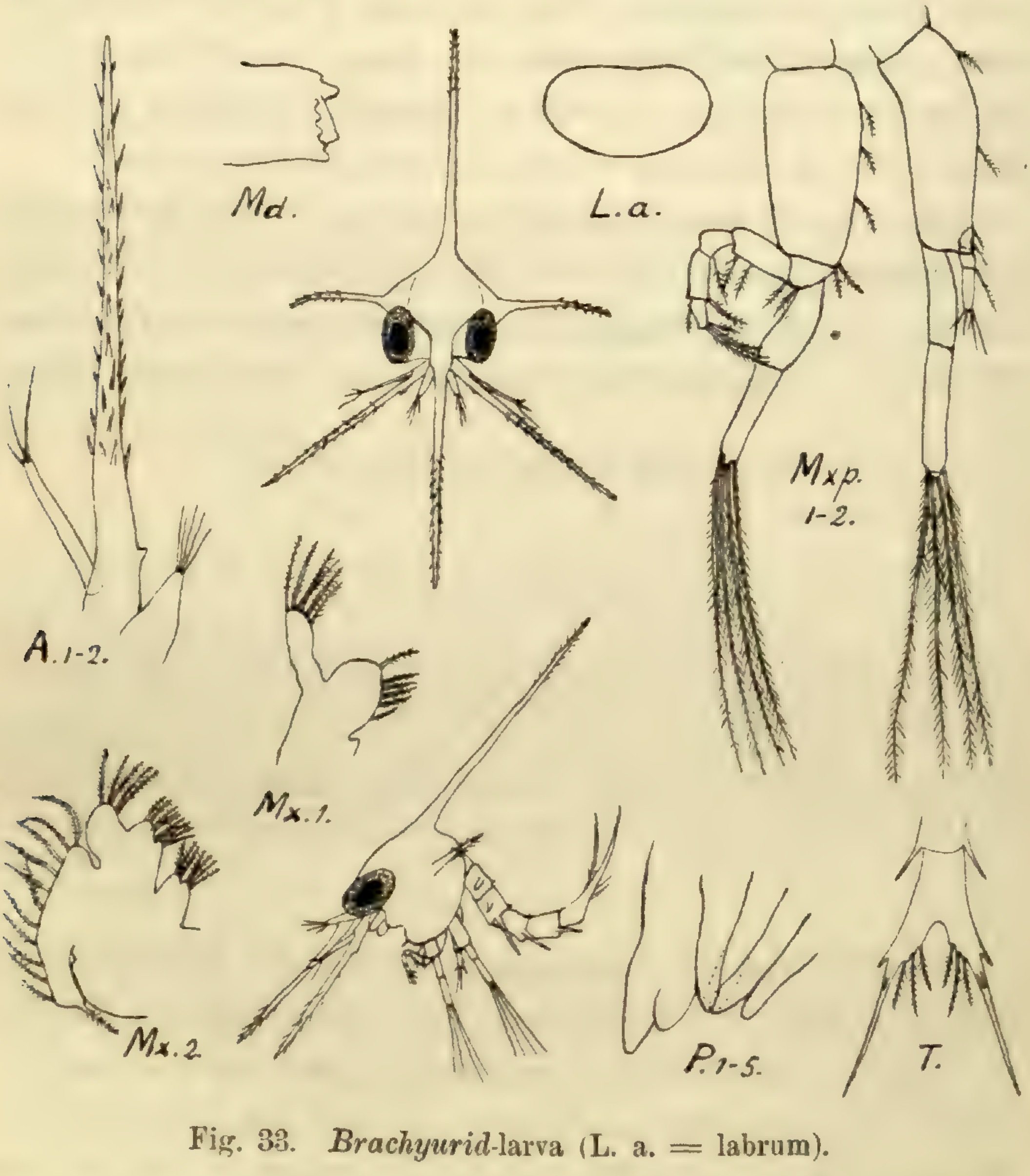


Fig. 33. *Brachyurid*-larva (L. a. = labrum).

any detailed description or fig. of the 1st Zoea; but the existence of a pair of dorsal spines on the 5th abdominal segment in his fig. seems to be the sole discrepancy not due to the difference in age. —

Description of the larva.

The length between the tips of the rostrum and of the dorsal spine 2 mm. The rostrum is about twice as long as the carapace

without spines; the dorsal spine is somewhat longer than the rostrum and about twice as long as the lateral spines. All the 4 spines on the carapace are almost straight and are in the distal part furnished with setæ. The carapace is somewhat globular; at the forepart of the under-edge there is at each side a rather deep incision behind which 4 setæ are fixed. The eyes are very large and have black pigment; nowhere else is pigment to be seen.

Antenna 1 is an unarticulated conical appendage with 5 (?) long setæ; but the number of these is difficult to determine as they most frequently lie close to one another. Antenna 2 is unarticulated; the exopodite is between 3 and 4 times as long as the endopodite, which has 3 setæ on the tip. A little distally to the place where the endopodite is fixed, but on the other side, the exopodite has a little prominence; for the rest it is furnished with small setæ like those on the spines of the carapace. The labrum has the usual form. The mandibles have no palp; the form of the mastigatory part may be seen from the fig.; but the 4 little rounded teeth are in several of the specimens not to be found. Maxilla 1 has no palp, but has the usual 3 lobes; the 1st lobe, the basal lobe, is rather broad, with 6 short, ciliated setæ; the mastigatory lobe is longer and narrower and has 6 setæ somewhat longer than those of the basal lobe. Maxilla 2 has the usual form with a large exopodite; palp and endopodite have 2 cleft lobes. In the 1st pair of maxillipeds the endopodite has 5 joints; it is a little shorter than the two-articulated exopodite that has 4 long natatory setæ at the tip. Also in the 2nd maxilliped the exopodite has 2 joints and 4 natatory setæ, but the endopodite is short and has but 3 joints. There are no traces of the 3d maxilliped. The pereiopods are short unarticulated appendages; the 1st pair are cleft. Of the pleopoda and uropoda there are no traces, and abdomen has but 6 segments. On the middle of each side of 2nd and 3rd abdominal segment there is a spine that is large and curved and there are long straight lateral spines on the hind edges of 3rd, 4th and 5th abdominal segments. Two little

bristles are placed dorsally on each abdominal segment. The telson has the same number of spines and about the same form as Williamson's fig. of *Hyas araneus* (l. c. fig. 70), but the hook in the hind-edge is narrower, being rounded acute-angled.

Compared with the 1st zoea of *Cancer pagurus* the larva described above differs, besides in regard to the abdominal segments, also in some small details in the appendages. Greater is the agreement with 1st zoea of *Hyas araneus* (Williamson l. c., Pl. 5 fig. 73), especially in regard to the abdomen; but the greatest agreement seems to me to be with the larva of *Cancer irroratus*. If the larvæ from the "Tjalfe" really belong to *Cancer irroratus*, they have a very great interest; for the adult *Cancer irroratus* is never found at Greenland, but lives at the east coast of N. America. Of the mentioned crabs only *Hyas araneus* lives at Greenland.

Larva of Munida Bamffica Penn.

Munida rugosa G. O. Sars, Bidrag til Decapodernes Forvandling II, Archiv f. Mathematik og Naturvidenskab, Christiania 1889, p. 178, Pl. 6.

(St. 292) 58° 24′ N, 30° 35′ W, 500 m. wire, 3—10—1908, 1 spec.

The larva belongs to the stage drawn by Sars (l. c.) fig. 12.

Larvæ of Munida (tenuimana G. O. Sars?) (figs. 34—36).

(St. 281) 57° 51′ N, 43° 57′ W, 500 m. wire, 29—9—1908, 3 spec.
(St. 285) 57° 51′ N, 43° 48′ W, 1000 m. wire, 29—9—1908, 2 spec.
(St. 278) 58° 16′ N, 47° 12′ W, 80—200 m. wire, 28—9—1908, 3 spec.
(St. 292) 58° 24′ N, 30° 35′ W, 500 m. wire, 3—10—1908, 1 spec.

At the stations above the "Tjalfe" has taken some larvæ belonging to a species of *Munida*. Some of the specimens belong to a stage between the stages figured by Sars (*Munida rugosa* l. c. 1889), some of them to a stage corresponding to the older of Sars's larvæ; the younger larvæ have no traces of pleopoda and are 11 mm. long (incl. rostrum), the older 14 mm. As my figures will show, there is in most regards a very good agreement with

Sars' figures; but I have not been able to find the two little teeth on the dorsal surface of the abdominal segments in spite of very close examination. In the specimen figured of the older larva the hinder lateral corners of the carapace reach to the hind-edge

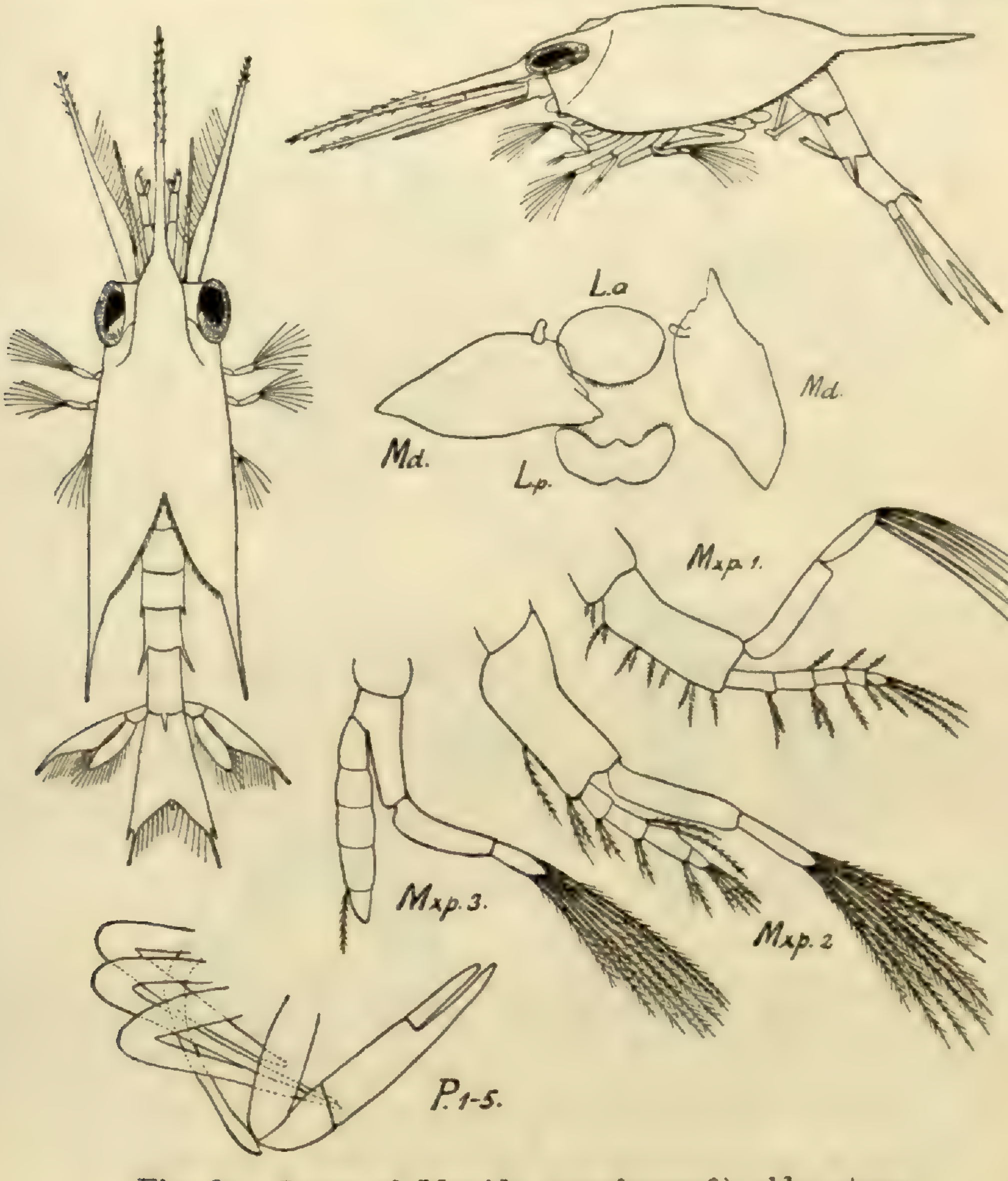


Fig. 34. Larva of *Munida (tenuimana?)*, older stage.

of the 6th abdominal segment; in the other specimens they are as long as in the specimens drawn by Sars. But in all the specimens the exterior spine on the corner of the telson is relatively much longer than in the species described by Sars; as this difference fully corresponds with the specific character in the genus *Galathea* (Sars l. c., p. 174, Pl. 5, fig. 3, 15, 26; — the specific character

in the squama of the genus *Galathea* [Sars l. c., p. 173, Pl. 5, fig, 3, 6, 19] is not to be found in the genus *Munida*, the squama in all stages and in both species having about the same form—), I find reason to believe, that these specimens belong to another species than that described by Sars.

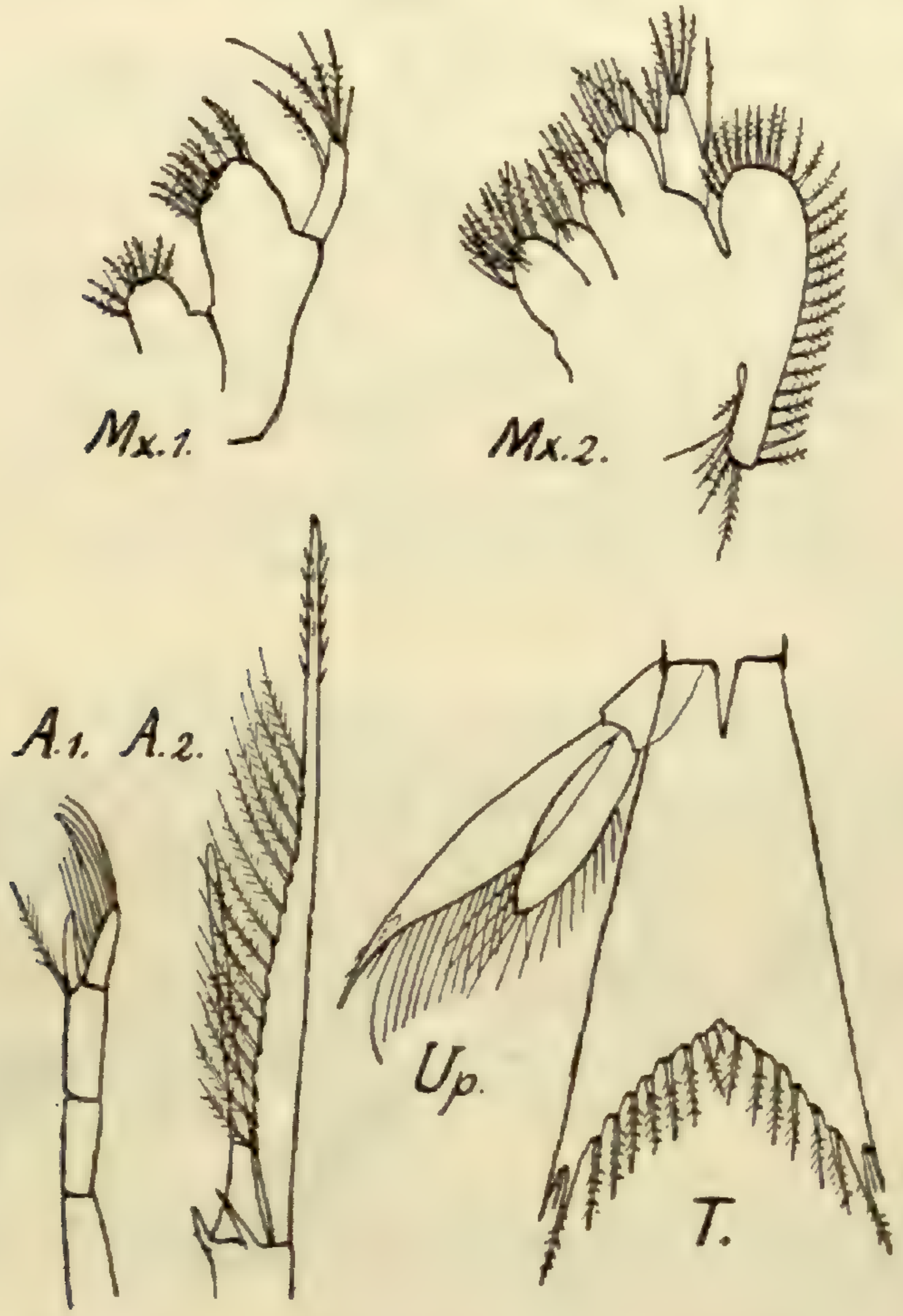


Fig. 35. Larva of *Munida (tenuimana?)* older stage.
The telson has in the specimen figured 7 setæ in the right side of the hook, 8 in the left side.

During a cruise in the summer 1911 has with the Danish Fisheries-investigation-steamer "Thor" in the Skagerak (57° 09′ N, 7° 16′ E, 25 miles NNW. ½ W. to the light house Lodbjerg, 44 m.) Dr. Th. Mortensen collected a large number of larvæ of *Munida*, and about all these larvæ totally correspond with the younger larvæ from the "Tjalfe" (the other larvæ belong to *M. Bamffica)*. *M. tenuimana*

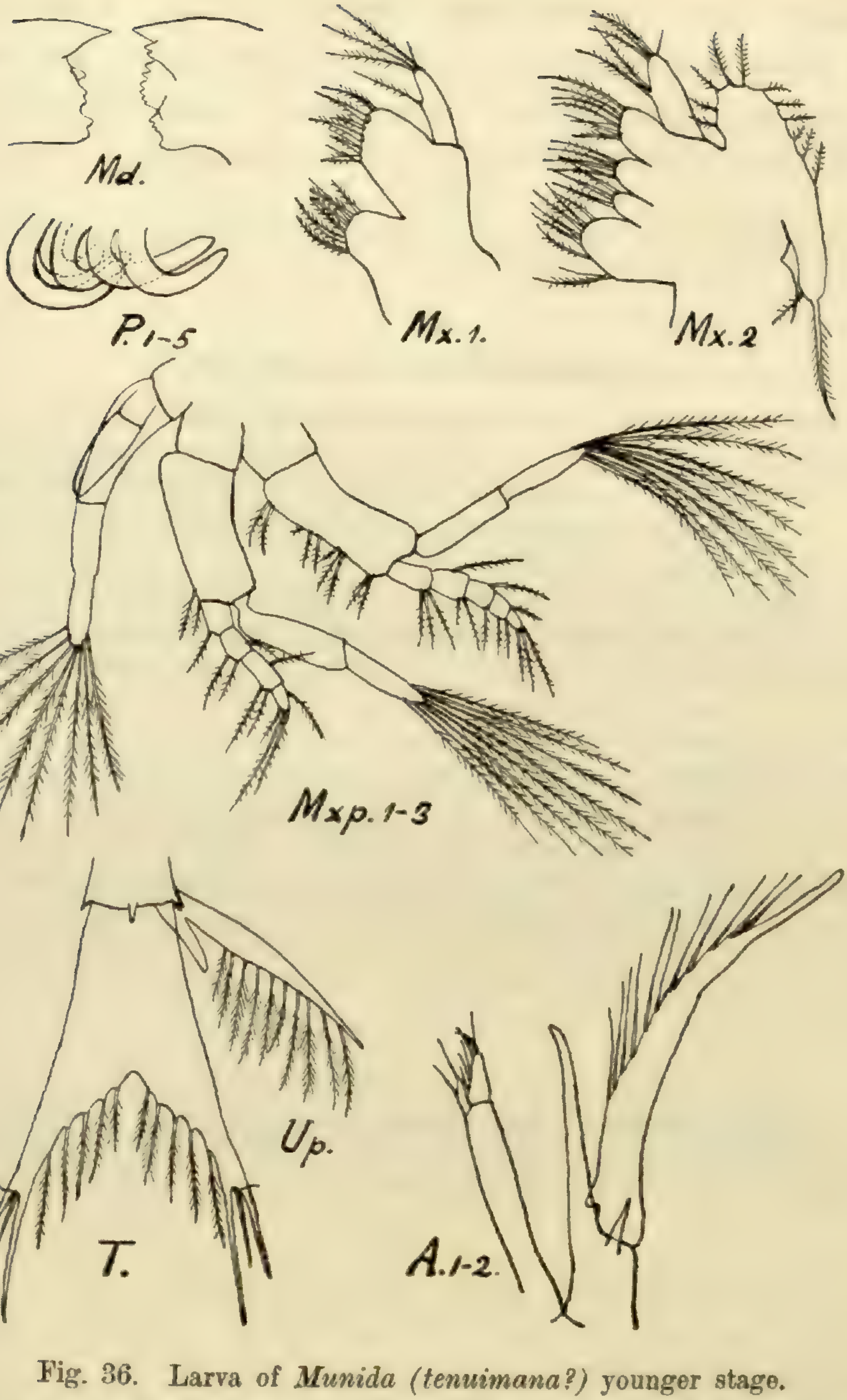


Fig. 36. Larva of *Munida (tenuimana?)* younger stage.
All the figs. are from specimens from the Skagerak except the fig. of A. 1—2 (from a specimen from the "Tjalfe").

being very common in the Skagerak, whilst *M. Bamffica* is seldom (of the latter species the Danish Fisheries-investigation-steamer "Thor" has taken but a single specimen, see my paper: Revideret

Fortegnelse over Danmarks marine Decapoda, Vidensk. Meddel. Naturh. Foren. København 1909 (1910), p. 274), and as we have only the two named species in the Skagerak, I mean, that also the larvæ from the "Tjalfe" belong to *Munida tenuimana*.

Abbreviations of literature.

Bell 1853, = Bell, *British stalk-eyed Crustacea*. 1853.

H. J. Hansen, V. Grønland = H. J. Hansen, *Malacostraca marina Groenlandiæ occidentalis*. Oversigt over det vestlige Grønlands Fauna af malakostrake Havkrebsdyr; Vid. Meddel. Naturh. Foren. Kjbhv. 1887.

H. J. Hansen, Ingolf = H. J. Hansen, *Crustacea Malacostraca* I. The Danish "Ingolf"-Expedition, vol. 3, part 2, 1908.

Kemp, Decap. Ireland, 1908 (1910) = Kemp, *Decapoda Natantia* of the coasts of Ireland. Fisheries, Ireland, Sci. Invest. 1908, I. (1910).

Ohlin 1901 = Ohlin, *Arctic Crustacea* collected during the Swedish arctic exped. 1898—1899, II. Decap., Schizop.; Bihang K. Svenska Vet. Akads. Handl., vol. 27, Afd. 4, 1901.

Stebbing, Tierreich = Stebbing, *Amphipoda I, Gammaridea;* Das Tierreich, Lief. 21, 1906.

All the figures are from drawings by the author except fig. 13 (photograph).

20—5—1912.

Some small Leptocephalids from the Atlantic.

By

Cand. mag. ***H. Blegvad.***

During my time of service onboard H. M. S. „Ingolf“ on a cruise to the Danish West-Indies in the winter of 1910—11, I was enabled, by the generosity of the Royal Navy department, to undertake pelagic hauls with a plankton-net on the way from Europe to the West-Indies and back.

The main purpose was to examine the distribution of the larvæ of Echinoderms, and the material of this kind collected will be dealt with by Dr. Th. Mortensen.

In addition, although the plankton-net measured only 1/2 meter in diameter, and each haul lasted only about 10 minutes, I caught at several places in the Atlantic Ocean some Leptocephalids or larvae of Murænoids. Three of these — though I do not venture at present to point out their relations to distinct species of Murænoids — are of special interest, inter alia on account of their small size. I give here therefore figures and a short description of these 3 Leptocephalids.

I. The smallest one, which has a length of 19.8 mm., was caught the 14th of November 1910 at 4 o'clock a. m. at the surface of the sea at 21° 34′ lat. N., 29° 50′ long. W. According to the kind communication of Dr. Johs. Schmidt, who has examined this Leptocephalid, it represents a species hitherto undescribed; I propose to name it in honour of Dr. Joh. Hjort, who was the first to find young Leptocephalids of *Anguilla vulgaris* South of the Azores.

Leptocephalus Hjorti *n. sp.*

Fig. 1 is a photograph in $^5/_3$ times enlargement. Fig. 2, which represents the same specimen, drawn with prism, shows the extension of the pigment. This consists of apparently black, but in reality brown, mostly branched chromatophores, which chiefly follow the chorda and the upper margin of the alimentary canal, as shown in the figure.

Fig. 1. 5:3.

On two places only, at a distance of respectively 6 and 11 mm from the point of the snout, there are great, branched chromatophores on the under side of the alimentary canal. At the tip of

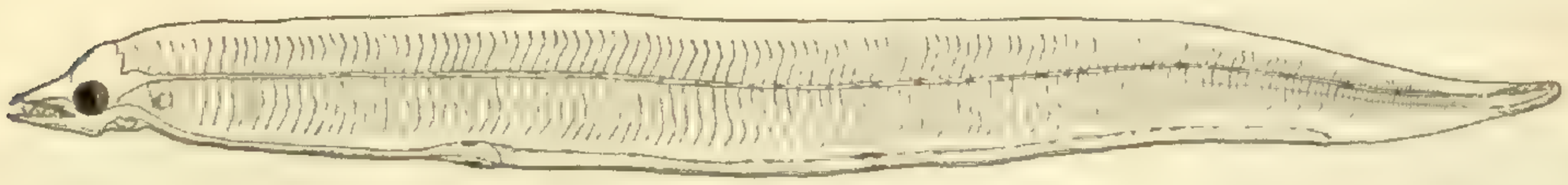


Fig. 2. ca. 5:1.

the tail the chromatophores form a continuous row above and below along the base of the tail fin. For the rest the form of the body is — as in other Leptocephalids — very strongly compressed. The vertical fins are little developed; in the extreme part of the tail fin only embryonic fin rays are to be seen. Interspinal elements are still wanting. The pectoral fins are nearly rudimentary. Fig. 3 shows the head; the lower jaw is more projecting than the upper, which has 6 forward pointing teeth on each side; the hindmost tooth is very small (not shown in the figure). In the lower jaw only 5 projecting teeth are seen on each side. All the teeth are long, straight and pointed, except the 2 foremost in the upper and lower jaw; these have namely a slight curvature at the

Fig. 3. 17:1.

base and are fastened, as figured, repectively outermost at the upper side of the upper jaw and outermost at the underside of the lower jaw.

The number of segments (myomeres) is about 182, or about 113 præanal and 69 postanal segments.

The greatest height of the body is	2,3	mm.
Distance from the point of the snout to anus	16,75	—
Length of the head	1,3	—
Distance from the point of the snout to the anterior margin of the eye	0,8	—
Diameter of the eye	0,4	—

II. Fig. 4 is a photograph of the next smallest Leptocephalid; its total length was 21,5 mm. This specimen was captured at the surface on 26° 45′ lat. N. 59° 35′ long. W. at 7 o'clock p. m. the 6th of March 1911. The body is compressed, the tail end tapering. Fig. 5 shows the distribution of the — very few — dark brown chromatophores

Fig. 4. 5:3.

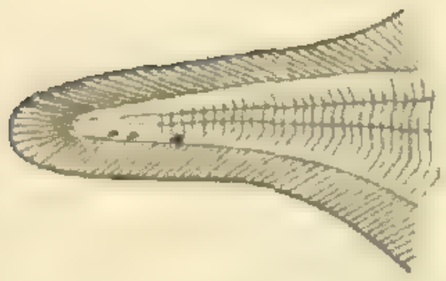


Fig. 5. 20:1.

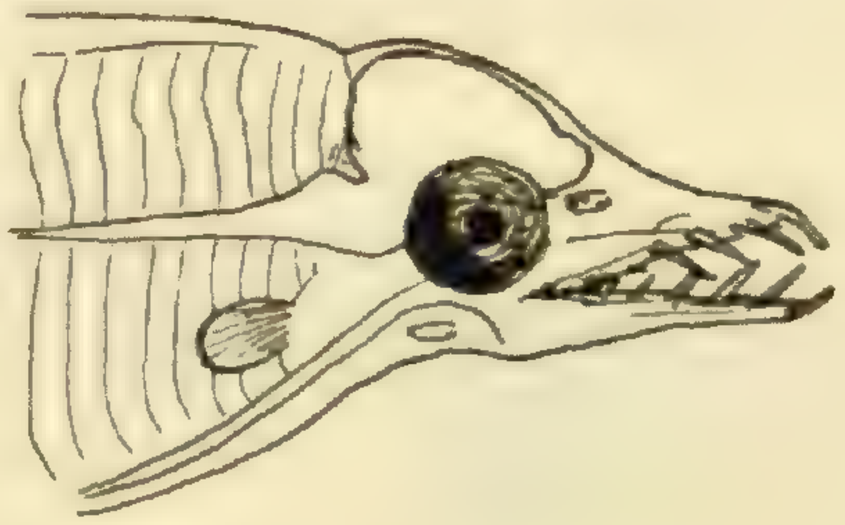


Fig. 6. 7:1.

on the tip of the tail. No pigment else is seen on the animal. The pectoral fins are small; embryonic fin rays are developed far forward in the vertical fins, but interspinalia are not yet visible. Fig. 6 represents the head with its powerfully developed teeth. The upper jaw has on each side 3 smaller teeth behind and 4 larger teeth in front. The lower jaw has on each side only 2 smaller and

4 larger teeth. All the teeth are projecting, the 2 foremost in the upper and lower jaw have a slight curvature and are, as was the case with the above mentioned specimen, fastened respectively at the upper side of the upper jaw and the underside of the lower jaw.

The number of segments is about 163 in all, or about 88 præanal and 75 postanal segments.

The greatest height of the body is.....	3,1 mm.
Distance from the point of the snout to anus	19,2 —
Length of the head	3,6 —
Distance from the point of the snout to the anterior margin of the eye	1,0 —
Diameter of the eye.....	0,7 —

Fig. 7. 3:2.

III. The third Leptocephalid (Fig. 7), which has a total length of 42,5 mm., probably belongs to the same species as No. II, but

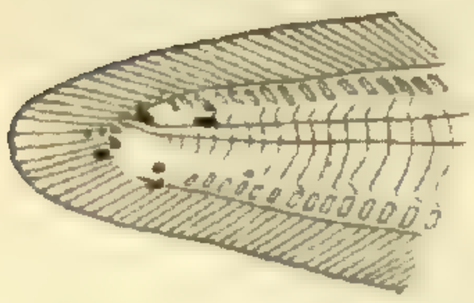


Fig. 8. 20:1.

Fig. 9. 7:1.

represents an older stage of development. They were both caught at the same place and at the same time. The form of the body of specimen No. III is very similar to that of specimen No. II; the tail end only is not so pointed. Tho pigment is, as shown in fig. 8, a little more developed, but otherwise, quite as in specimen

No. II, confined to dark brown chromatophores on the tip of the tail. The pectoral fins still have embryonic fin rays, which is also the case in the vertical fins, but distinct interspinal elements are now developed to the number of about 112 in the anal fin and about 140 in the dorsal fin; (damage of the fins caused some difficulty in the exact counting of the interspinalia).

Fig. 9 represents the head, which is not so distinctly marked from the body and has a more depressed form than in the above mentioned specimen. In the upper jaw there are 4 smaller and 8 larger teeth on each side, but the foremost tooth, which has a slight curvature at the base and is fastened outermost at the upper side of the upper jaw, was broken and is not figured. The lower jaw has 3 smaller and 8 larger teeth on each side. For the rest the teeth are exactly as those mentioned above.

The number of segments is about 91 præanal and 67 post-anal, or about 158 in all.

The greatest height of the body is	7,1 mm.
Distance from the point of the snout to anus.....	34,0 —
Length of the head	3,3 —
Distance from the point of the snout to the anterior margin of the eye	1,8 —
Diameter of the eye	0,8 —

In „Leptocephalids in the University zoological museum of Upsala“ by Dr. Pehr Strömman, a species is described under the name *Leptocephalus lanceolatus*, which agrees in several regards with my specimens Nos. II and III; unfortunately the number of segments is not indicated. Meantime Dr. Johs. Schmidt in his recently published „Contributions to the biology of some North Atlantic species of Eels“ (Vidensk. Medd. Naturh. Forening København, Vol. 64. 1912), after having examined the type specimens of this species, gives the number of myomeres as ca. 160, of which about 88 pre-anal. After this it can scarcely be doubted that my specimens Nr. II and III are really this species.

It is stated that pigment is quite absent in Dr. Strømman's *Leptocephalus lanceolatus*, but this can be caused, without doubt, by an insufficient preservation.

I am indebted to Docent R. H. Stamm for his assistance in photographing the Leptocephalids, and to the Officers of the „Ingolf" for their kind help onboard; in particular I would thank the Captain of the ship, Commander C. V. E. Carstensen, and Lieutenant Godfred Hansen for their kindness and interest in my work during the whole voyage.

19—7—1912.

Fuglene ved de danske Fyr i 1911.

29de Aarsberetning om danske Fugle.

Ved

R. Horring.

Med et Kort.

I 1911 indsendtes fra 32 af de danske Fyr til Universitetets zoologiske Museum 923 Fugle af 68 Arter faldne om Natten i Træktiderne. Sikker Efterretning haves om 2117 artsbestemte faldne Fugle, idet Prøver af disse ere indsendte. Ifølge Fyrmestrenes Opgivelser er endyderligere opsamlet c. 855 faldne Fugle, hvoraf c. 510 vare Drosler. Nøjere Efterretning haves saaledes om c. 3000 Fugles Død ved Fyrene. Endelig meldes fra Fyrskibene, at overmaade mange Fugle ere faldne i Søen efter at være dræbte ved Fyrruderne. I det hele er der sikkert faldet mindst 4000 Fugle.

De Fyr, hvorfra Fugle indsendtes, vare: *Graadyb* Fyrskib, J. S. Ibsen Fyrskibsfører (42 Fugle fra 20 Nætter); *Vyl* Fyrskib, J. S. Jensen Fyrskibsfører (85 Fugle fra 35 Nætter); *Horns Rev* Fyrskib, H. Sonnichsen Fyrskibsfører (29 Fugle fra 4 Nætter); *Lyngvig* Fyr, P. A. Larsen Fyrmester (50 Fugle fra 26 Nætter); *Lodbjerg* Fyr, P. S. Pedersen Fyrmester (48 Fugle fra 8 Nætter); *Hanstholm* Fyr, H. Roed Fyrmester (15 Fugle fra 3 Nætter); *Rubjerg Knude* Fyr, J. C. Boysen Fyrmester (28 Fugle fra 2 Nætter); *Hirtshals* Fyr, H. Hinrichsen Fyrmester (11 Fugle fra 1 Nat); *Skagen* Fyr, G. H. E. Wielandt Fyrmester (39 Fugle fra 6 Nætter); *Læsø Trindel* Fyrskib, P. V. Eriksen Fyrskibsfører (50 Fugle

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fra 14 Nætter); *Læsø Rende* Fyrskib, P. C. Grumsen Fyrskibsfører (40 Fugle fra 13 Nætter); *Østre Flak* Fyrskib, N. C. Knudsen Fyrskibsfører (83 Fugle fra 23 Nætter); *Anholt Knob* Fyrskib, T. A. M. Andresen Fyrskibsfører (38 Fugle fra 23 Nætter); *Anholt* Fyr, J. P. Nielsen Fyrmester (102 Fugle fra 7 Nætter); *Schultz's Grund* Fyrskib, P. Larsen Fyrskibsfører (78 Fugle fra 10 Nætter); *Fornæs* Fyr, A. Kruse Fyrmester (1 Fugl); *Hjelm* Fyr, A. P. Jensen Fyrmester (3 Fugle fra 1 Nat); *Thunø* Fyr, C. Kjeldsen Fyrpasser (2 Fugle fra 2 Nætter); *Sejrø* Fyr. N. J. Z. Nielsen Fyrmester (7 Fugle fra 2 Nætter); *Nakkehoved* Fyr, W. Schultz Fyrmester (2 Fugle fra 2 Nætter); *Lappegrunden* Fyrskib, J. C. Jensen Fyrskibsfører (1 Fugl); *Drogden* Fyrskib, N. J. Kromann Fyrskibsfører (2 Fugle fra 2 Nætter); *Stevns* Fyr, L. D. A. Wedén Fyrmester (31 Fugle fra 5 Nætter); *Sprogø* Fyr, A. V. Hansen Fyrmester (2 Fugle fra 2 Nætter); *Omø* Fyr, P. F. Køhler, Fyrmester (6 Fugle fra 3 Nætter); *Hov* Fyr, H. V. O. Westermann Fyrmester (2 Fugle fra 2 Nætter); *Kjels Nor* Fyr, J. C. Ryder Fyrmester (87 Fugle fra 12 Nætter); *Æbelø* Fyr, E. W. F. C. Schönfeldt Fyrmester (3 Fugle fra 2 Nætter); *Hammeren* Fyr, A. M. Dam Fyrmester (2 Fugle fra 2 Nætter); *Gedser* Fyr, P. A. C. Lindgaard Fyrmester (5 Fugle fra 4 Nætter); *Gedser Rev* Fyrskib, J. Jensen Fyrskibsfører (21 Fugle fra 3 Nætter); *Hyllekrog* Fyr, P. W. Sørensen og J. N. B. Höeg Fyrmestre (8 Fugle fra 5 Nætter).

De Fugle, der indkom til Zoologisk Museum som faldne i 1911, vare:

1. *Anas crecca* 1.
2. *Oedemia nigra* 4.
3. *Tachybaptes minor* 1.
4. *Procellaria pelagica* 1.
5. *Procellaria leucorrhoa* 2,
6. *Porzana maruetta* 4.
7. *Rallus aquaticus* 4.
8. *Gallinula chloropus* 1.

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9. *Vanellus cristatus* 3. (16 faldt.)
10. *Charadrius squatarola* 1.
11. *Charadrius pluvialis* 2.
12. *Eudromias morinellus* 1.
13. *Ægialitis hiaticula* 1.
14. *Hæmatopus ostreologus* 1.
15. *Numenius arquatus* 2.
16. *Actitis hypoleuca* 1.
17. *Totanus calidris* 2.
18. *Tringa canutus* 4.
19. *Tringa alpina* 2.
20. *Calidris arenaria* 1.
21. *Limnocryptes gallinula* 4.
22. *Gallinago scolopacina* 6.
23. *Scolopax rusticula* 1. (4 faldt.)
24. *Columba livia domestica* 1.
25. *Columba palumbus* 2. (4 faldt.)
26. *Jynx torquilla* 11.
27. *Alauda arborea* 1.
28. *Alauda arvensis* 144. (306 faldt.)
29. *Sturnus vulgaris* 54. (86 faldt.)
30. *Troglodytes parvulus* 3.
31. *Accentor modularis* 1.
32. *Sylvia cinerea* 4. (5 faldt.)
33. *Sylvia atricapilla* 6.
34. *Sylvia hortensis* 15.
35. *Sylvia nisoria* 1.
36. *Hypolais icterina* 1.
37. *Acrocephalus arundinaceus* 1..
38. *Acrocephalus phragmitis* 2.
39. *Phyllopseustes trochilus* 31. (53 faldt.)
40. *Phyllopseustes rufus* 1.
41. *Regulus cristatus* 6.
42. *Anthus pratensis* 3.

(1911.)

43. *Anthus arboreus* 3.
44. *Anthus obscurus* 1.
45. *Turdus iliacus* 151. (766 faldt.)
46. *Turdus musicus* 96. (257 faldt.)
47. *Turdus viscivorus* 2.
48. *Turdus pilaris* 51. (182 faldt).
49. *Turdus torquatus* 9.
50. *Turdus merula* 37. (77 faldt.)
51. *Saxicola oenanthe* 46.
52. *Praticola rubetra* 3.
53. *Ruticilla phoenicura* 24.
54. *Erithacus rubecula* 80.
55. *Cyanecula suecica* 1.
56. *Luscinia vera* 1.
57. *Muscicapa atricapilla* 16. (28 faldt.)
58. *Muscicapa grisola* 2.
59. *Passer domesticus* 1.
60. *Passer montanus* 1.
61. *Fringilla coelebs* 2.
62. *Fringilla montifringilla* 22.
63. *Cannabina linota* 2.
64. *Cannabina linaria* 1.
65. *Emberiza schoeniclus* 13.
66. *Emberiza citrinella* 2.
67. *Emberiza miliaria* 2.
68. *Emberiza nivalis* 16.

Af de faldne Arter var en, nemlig *Luscinia vera*, ikke faldet ved Fyrene i Løbet af de foregaaende 25 Aar. Tallet paa de Arter, der ere faldne i Løbet af de sidste 26 Aar, er dermed naaet op til 159.

(1911.)

Fortegnelse over de Fugle der ere indsendte fra Fyrene som faldne om Natten.

(Hver Nat henregnes til den følgende Dag.)

1. *Anas crecca.* Krikand.
   August: 31te Lyngvig 1.
2. *Oedemia nigra.* Sortand.
   Marts: 1ste Graadyb 2 (♂ ad., ♂ jun.).
   April: 21de Omø 2 ♂.
3. *Tachybaptes minor.* Lille Lappedykker.
   April: 29de Hyllekrog 1 ♂.
4. *Procellaria pelagica.* Stormsvale.
   November: 20de Lyngvig 1 ♀ jun.
5. *Procellaria leucorrhoa.* Stor Stormsvale.
   Januar: 8de Sprogø 1 ♀ jun.
   December: 30te Sejrø 1.
6. *Porzana maruetta.* Rørvagtel.
   April: 2den Kjels Nor 1 ♂.
   28de Lyngvig 1 ♀ ad.
   29de Hanstholm 1 ♂.
   Maj: 4de Skagen 1 ♂.
7. *Rallus aquaticus.* Vandrikse.
   April: 22de Lyngvig 1.
   26de Schultz's Grund 1.
   27de Skagen 1 ♂.
   28de Kjels Nor 1.
8. *Gallinula chloropus.* Rørhøne.
   Marts: 29de Sprogø 1 ♀ ad.
9. *Vanellus cristatus.* Vibe.
   Marts: 1ste Kjels Nor 1.
   4de (Blaavandshuk 1.)*)
   [28de Lyngvig 1 (2 faldt.).
   April: 2den Lyngvig 1 (12 faldt.).

*) I Klammer er, efter Fyrmestrenes Oplysninger, vedføjet Tallet paa de faldne Fugle, naar dette er et andet end Tallet paa de indsendte; paa samme Maade vedføjes efter Fyrmestrenes Opgivelser Viber, Skovsnepper og Stære, selv om intet er indsendt.

(1911.)

10. *Charadrius squatarola.* Strandhjejle.

September: 25de Lodbjerg 1.

11. *Charadrius pluvialis.* Hjejle.

April: 22de Lyngvig 1.

Oktober: 2den Anholt 1.

12. *Eudromias morinellus.* Pomeransfugl.

August: 28de Rubjerg Knude 1 ♂ jun.

13. *Ægialitis hiaticula.* Præstekrave.

April: 29de Lodbjerg 1 ♀.

14. *Hæmatopus ostreologus.* Strandskade.

September: 17de Hammeren 1 jun.

15. *Numenius arquatus.* Storspove.

April: 23de Lyngvig 1.

24de Skagen 1 ♂.

16. *Actitis hypoleuca.* Mudderklire.

April: 27de Skagen 1 ♂.

17. *Totanus calidris.* Rødben.

Marts: 15de Graadyb 1 ♀ ad.

August: 28de Rubjerg Knude 1 ♀ jun.

18. *Tringa canutus.* Islandsk Ryle.

August: 22de Lyngvig 1 ♂ jun.

26de Lyngvig 1 jun.

29de Lyngvig 1 ♀ jun.

September: 1ste Fornæs 1 ♂ jun.

19. *Tringa alpina.* Ryle.

April: 28de Lyngvig 1 ♂.

December: 18de Læsø Rende 1 ♀ jun.

20. *Calidris arenaria.* Selning.

August: 29de Vyl 1 ♂ jun.

21. *Limnocryptes gallinula.* Enkelt Bekkasin.

April: 22de Kjels Nor 1.

28de Kjels Nor 1.

30te Æbelø 1 ♀.

November: 21de Stevns 1.

(1911.)

22. *Gallinago scolopacina.* Horsegøg.

Marts: 28de Lyngvig 1.

Maj: 3dje Lyngvig 1.

4de Skagen 1.

September: 25de Kjels Nor 1.

November: 20de Lodbjerg 2.

23. *Scolopax rusticula.* Skovsneppe.

April: 26de Hammeren 1.

November: 20de (Hesselø 3.)

24. *Columba livia domestica.* Husdue (Brevdue.).

Juli: 24de Omø 1.

25. *Columba palumbus.* Ringdue.

April: 1ste Kjels Nor 1.

Oktober: 2den Anholt 1 (3 faldt.).

26. *Iynx torquilla.* Vendehals.

April: 23de Æbelø 1 ♂.

24de Anholt 1 ♀ ad.

27de Læsø Rende 1 ♂, Østre Flak 1 ♂, Sejrø 1 ♂.

Maj: 3dje Hanstholm 1 ♂, Lodbjerg 1 ♀, Kjels Nor 1 ♂.

15de Skagen 1 ♀.

August: 21de Nakkehoved 1 ♀ jun.

23de Stevns 1 ♀ jun.

27. *Alauda arborea.* Hedelærke.

Marts: 4de Hyllekrog 1.

28. *Alauda arvensis.* Lærke.

Januar: 8de Kjels Nor 1 ♂.

26de Vyl 1 ♂.

27de Vyl 4 ♂, Lyngvig 1 ♂ (10 faldt).

28de Vyl 1 ♂.

30te Vyl 2 ♂.

Februar: 7de Vyl 1 ♂.

18de Vyl 1 ♀ ad., Horns Rev 2 ♀,

19de Lappegrunden 1 ♂.

20de Østre Flak 2.

(1911.)

Februar: 23de Læsø Trindel 1 ♂.

24de Læsø Rende 2, Østre Flak 4.

25de Læsø Trindel 1 ♂, Læsø Rende 2, Østre Flak 1.

26de Læsø Rende 5, Østre Flak 2, Schultz's Grund 5 (1 ♀, 4 ♂), (Sejrø 60 faldt.)

Marts: 1ste Læsø Trindel 1 ♂.

2den Østre Flak 3.

3dje Læsø Trindel 1 ♂.

4de Graadyb 1 ♀, Anholt Knob 1 ♂ (3 faldt.), Hjelm 2 ♂, Gedser Rev 5 (3 ♂, 1 ♀ ad., 1 ♀ jun., 10 faldt.)

5te Graadyb 1 ♀.

8de Kjels Nor 1 ♀ jun.

14de Graadyb 1 ♀ ad.

17de Vyl 1 ♀.

28de Vyl 1 ♀ ad.

April: 24de Anholt 2 ♀.

26de Schultz's Grund 2 ♀.

August: 28de Rubjerg Knude 1.

29de Lyngvig 1 ♂.

September: 24de Vyl 6 (5 ♀ jun., 1 ♀ ad.).

Oktober: 1ste Østre Flak 1, Anholt 3 (2 ♀ ad., 1 ♀ jun.), Schultz's Grund 2.

7de Vyl 1 ♀ ad.

24de Læsø Trindel 1 ♂.

25de Lodbjerg 2, Østre Flak 2 ♂, Anholt Knob 3 ♂, Anholt 16 (9 ♂, 7 ♀, 88 faldt.), Schult'z Grund 4 (3 ♂, 1 ♀, 7 faldt.).

26de Stevns 1 ♀ jun.

27de Graadyb 1 ♂, Vyl 3, Horns Rev 3 ♂, Lyngvig 1 ♂, Anholt 2 (♂, ♀), Anholt Knob 1 ♂.

28de Lyngvig 1 ♂ (10 faldt).

29de Stevns 11 (6 ♂, 5 ♀), Hov 1 ♀.

November: 14de Lyngvig 1 ♂ jun. (3 faldt).

19de Graadyb 2 ♂.

(1911.)

November: 20de Lyngvig 1 ♀, Anholt 1 ♂.
22de Østre Flak 1 ♂, Schultz's Grund 2 ♂.
23de Østre Flak 1 ♂.
29de Østre Flak 1 ♂ jun.
December: 9de Østre Flak 1.
12te Læsø Rende 1 ♂.
19de Anholt Knob 1 ♂.

29. *Sturnus vulgaris.* Stær.

Januar: 27de (Blaavandshuk 1.).
Februar: 19de (Vestborg 1.).
22de (Gedser Rev 1.).
25de Graadyb 1 ♂ ad.
26de Horns Rev 1 ♂ ad., (Sejrø 2.).
28de Vyl 1 ♂ ad.
Marts: 1ste Graadyb 1 ♂ ad., (Blaavandshuk 1.), Lyngvig 1 ♀ ad. (4 faldt.), Læsø Trindel 1 ♀ ad.
2den Vyl 1 ♂ ad., Lyngvig 1 ♂ ad. (11 faldt.), Lodbjerg 9 (5 ♂ ad., 3 ♀ ad., 1 ♀ jun.), (Læsø Rende 1.), Østre Flak 1 ♂ ad., Schultz's Grund 2 ♂.
3dje Læsø Trindel 1 ♂, (Graadyb 1.).
4de Graadyb 1 ♀ ad., Vyl 2 (1 ♀ jun.), Hjelm 1 ♀ ad., Thunø 1 ♂ ad.
8de Kjels Nor 2 (♀ ad., ♂).
9de Graadyb 1 ♂ jun.
23de (Gedser Rev 1.).
30te Vyl 1 ♀.
April: 2den Hov 1 ♀ ad., Kjels Nor 4.
3dje Graadyb 2.
4de Graadyb 3.
16de Anholt Knob 1 ♂ ad.
23de Vyl 1 ♂, Anholt 1 ♀ (2 faldt).
28de (Vestborg 1.).
September: 25de Schultz's Grund 1.
Oktober: 6te Graadyb 1 ♀ jun.

(1911.)

Oktober: 15de Graadyb 1 ♀ jun.

24de (Blaavandshuk 2.).

25de (Blaavandshuk 2.), Vyl 1, Lodbjerg 2, Rubjerg Knude 1, Anholt Knob 1 ♀ ad., Schultz's Grund 1 ♀ jun.

27de (Blaavandshuk 1.), (Hesselø 2.).

November: 2den (Gedser Rev 1.).

20de Læsø Rende 1 ♀ ad., Anholt Fyr 1 ♀ jun.

30. *Troglodytes parvulus.* Gærdesmutte.

April: 2den Kjels Nor 1 ♂.

September: 16de Anholt Knob 1.

Oktober: 19de Lyngvig 1.

31. *Accentor modularis.* Jernspurv.

April: 23de Anholt Fyr 1.

32. *Sylvia cinerea.* Tornsanger.

Maj: 15de Skagen 1 ♀.

August: 28de Hirtshals 1 ♂ jun., Skagen 2 (♂, ♂ jun., 3 faldt.).

33. *Sylvia atricapilla.* Munk.

Maj: 2den Kjels Nor 1 ♂.

25de Kjels Nor 1 ♀.

September: 24de Vyl 1 ♀ jun.

25de Kjels Nor 2, Gedser Rev 1 ♂.

34. *Sylvia hortensis.* Havesanger.

Maj: 25de Kjels Nor 2.

August: 28de Rubjerg Knude 3, Hirtshals 1, Skagen 2.

September: 24de Vyl 1 ♂ jun., Hanstholm 1.

25de Anholt Knob 1, Kjels Nor 3, Gedser 1.

35. *Sylvia nisoria.* Høgesanger.

August: 29de Lyngvjg 1 ♀ jun.

36. *Hypolais icterina.* Gulbug.

Maj: 25de Hyllekrog 1.

37. *Acrocephalus arundinaceus.* Rørsanger.

Maj: 25de Kjels Nor 1 ♂.

(1911.)

38. *Acrocephalus phragmitis.* Sivsanger.

April: 28de Kjels Nor 1 ♂.

September: 25de Gedser 1.

39. *Phyllopseustes trochilus.* Løvsanger.

April: 26de Schultz's Grund 1 ♂.

Maj: 16de Østre Flak 1.

25de Kjels Nor 1.

August: 28de Rubjerg Knude 9, Hirtshals 8 (2 ♀ jun., 1 ♂, 1 ♀ ad.), Skagen 4 (26 faldt.), Læsø Trindel 2 (1 ♀ jun.).

September: 24de Vyl 2 (♂, ♀), Lodbjerg 1.

25de Graadyb 1, Gedser Rev 1.

40. *Phyllopseustes rufus.* Gransanger.

Oktober: 1ste Anholt 1.

41. *Regulus cristatus.* Fuglekonge.

April: 26de Schultz's Grund 1 ♀.

29de Østre Flak 1 ♂.

September: 25de Graadyb 1 ♂.

Oktober: 10de Anholt Knob 1 ♀.

25de Østre Flak 1 ♂.

November: 19de Østre Flak 1 ♂.

42. *Anthus pratensis.* Engpiber.

April: 2den Vyl 1.

September: 6te Vyl 1.

Oktober: 9de Vyl 1.

43. *Anthus arboreus.* Skovpiber.

September: 24de Vyl 2 (1 ♂).

25de Kjels Nor 1.

44. *Anthus obscurus.* Skærpiber.

Oktober: 24de Lyngvig 1.

45. *Turdus iliacus.* Vindrossel.

April: 22de Kjels Nor 2.

24de Skagen 2, Østre Flak 1.

(1911).

April: 27de Læsø Rende 1, Anholt Knob 1, Sejrø 2, Omø 1.
28de Stevns 1.
Oktober: 15de Graadyb 1 ♀ jun.
20de Læsø Trindel 6 (3 ♂ jun., 1 ♂ ad., 2 ♀ ad.).
24de Vyl 2, Lyngvig 1 ♀ ad. (68 faldt), Læsø Trindel 6 (1 ♂ jun., 2 ♂ ad., 3 ♀ jun.), Gedser 1.
25de Vyl 1, Lodbjerg 14, Horns Rev 12, Rubjerg Knude 10, Østre Flak 10 (5 ♂, 1 ♀ ad., 3 ♀ jun.), Anholt Knob 1 ♂, Anholt 1 ♀ ad. (c. 18 faldt), Schultz's Grund 5 (2 ♂, 3 ♀ jun., 21 faldt).
26de Lyngvig 1 ♀ ad., Stevns 2 (1 ♂ jun., 1 ♀ jun.).
27de Graadyb 4 (3 ♂ ad., 1 ♀ jun.,), Vyl 1, Horns Rev 8, Lyngvig 1 ♂ ad. (327 faldt.), Anholt 13 (6 ♂, 7 ♀ ad., 142 faldt).
28de Vyl 1, Lyngvig 1 ♂, Kjels Nor 20.
November: 11te Læsø Trindel 2.
20de Lyngvig 1, Østre Flak 1 (mange faldt), Anholt Knob 5 (65 faldt.).
21de Anholt Knob 1, Stevns 2.
22de Østre Flak 2, Schultz's Grund 2.
December: 17de Gedser 1.

46. *Turdus musicus.* Sangdrossel.

April: 1ste Hyllekrog 1 ♂.
20de Schultz's Grund 2 (16 faldt.).
22de Vyl 1 (2 faldt), Læsø Rende 4, Kjels Nor 2.
23de Graadyb 1, Vyl 1 (6 faldt.), Læsø Trindel 1, Anholt Knob 1, Æbelø 1.
24de Skagen 2, Østre Flak 1, Anholt 2 (19 faldt).
26de Vyl 1 (6 faldt.), Schultz's Grund 2 (4 faldt.).
27de Skagen 1 (20 faldt.), Læsø Rende 1, Østre Flak 4.
28de Schultz's Grund 4 (10 faldt, mange udenbords), Stevns 1, Kjels Nor 9.
29de Lodbjerg 2, Østre Flak 1.

(1911.)

30te Skagen 1 (20 faldt).

Maj: 2den Lyngvig 1 (4 faldt.).

3dje Lodbjerg 1, Hanstholm 2.

September: 23de Gedser 1 jun.

24de Vyl 2 ♂.

25de Lodbjerg 1, Læsø Rende 1 ♀ jun., Østre Flak 1 ♂ jun., Kjels Nor 1.

Oktober: 1ste Graadyb 1 ♂ jun., Schultz's Grund 13, Gedser Rev 6.

2den Anholt Knob 3 (1 ♂ ad., 1 ♀ ad., 56 faldt.).

24de Læsø Trindel 1 jun.

25de Horns Rev 1, Lodbjerg 1, Østre Flak 5 (4 ♂, 1 ♀ ad.), Anholt 1 ♀ ad. (c. 18 faldt.)

27de Graadyb 2 ♂. Vyl 1.

28de Kjels Nor 2.

29de Stevns 1 ♂.

47. *Turdus viscivorus.* Misteldrossel.

April: 28de Stevns 1 ♀.

Oktober: 25de Anholt Knob 1 ♀ ad.

48. *Turdus pilaris.* Sjagger.

Februar: 26de Horns Rev 1 ♀ ad.

April: 22de Graadyb 1, Lyngvig 1 (2 faldt.).

23de Anholt Fyr 1 ♂ (32 faldt.).

24de Skagen 1 ♀, Anholt 1 ♀ ad. (6 faldt.).

26de Graadyb 1 ♀.

27de Anholt Knob 1 ♂, Omø 1 ♀.

28de Stevns 1 ♀, Kjels Nor 1.

29de Østre Flak 3.

30te Skagen 1 ♂ (4 faldt).

Oktober: 25de Vyl 1.

27de Graadyb 1 ♂, Vyl 1.

November: 2den Vyl 1, Lyngvig 1 (4 faldt.).

12te Anholt Knob 1.

14de Lyngvig 1.

(1911.)

November: 15de Østre Flak 1 ♂, Anholt Knob 1.

20de Lyngvig 1, Lodbjerg 1, Læsø Rende 7 (1 ♂, 3 ♀ ad., 1 ♀ jun.), Østre Flak 1 ♂ (mange faldt.), Anholt Knob 1, Anholt 6 (1 ♂ ad., 2 ♀ ad, 1 ♀ jun., 92 faldt), Nakkehoved 1 (3 faldt.).

21de Østre Flak 2.

22de Schultz's Grund 6.

29de Østre Flak 1.

49. *Turdus torquatus.* Ringdrossel.

April: 23de Anholt 1 ♂.

24de Læsø Trindel 1.

27de Østre Flak 1 ♂.

29de Lodbjerg 1 ♂, Hanstholm 1 ♂.

Maj: 3dje Vyl 1.

September: 24de Hanstholm 1 ♀ ad.

Oktober: 1ste Gedser Rev 1.

3dje Vyl 1 ♂ jun.

50. *Turdus merula.* Solsort.

Februar: 26de Vyl 1 ♂ ad.

Marts: 1ste Læsø Trindel 1 ♀ ad.

4de Graadyb 1 ♀ ad.

8de Kjels Nor 1 ♂ ad.

April: 24de Læsø Trindel 1 ♀.

27de Sejrø 1 ♂ ad., Omø 1 ♀.

29de Hanstholm 1 ♂.

Oktober: 7de Vyl 1 ♀ jun.

24de Læsø Trindel 2 (1 ♂ jun., 1 ♀ jun.).

25de Rubjerg Knude 1 ♀ ad., Østre Flak 1 ♀ jun., (Hesselø 2.), Schultz's Grund 1 ♀ jun.

27de Schultz's Grund 1 ♂ jun., (Hesselø 3.).

November: 11te Læsø Trindel 5 (2 ♂ jun., 2 ♀ jun.).

12te Østre Flak 1 ♂ ad.

13de Thunø 1 ♀ jun.

14de Lyngvig 1.

(1911.)

20de Østre Flak 1 ♀ jun. (mange faldt), Anholt Knob 1 ♂ jun. (2 faldt), Anholt 4 (♂ ad., ♂ jun., 2 ♀ ad., 28 faldt), (Hesselø 10).

21de Østre Flak 4 (2 ♂ ad., 1 ♂ jun., 1 ♀).

22de Anholt Knob 1 ♂ ad., Schultz's Grund 3 (♂ jun., ♀ jun., ♀ ad.).

51. *Saxicola oenanthe.* Stenpikker.

April: 23de Graadyb 2 (♂, ♀), Vyl 2 ♂, Anholt 1 ♀.

24de Læsø Rende 1 ♂, Anholt 1 ♀.

26de Graadyb 1 ♂, Vyl 2 ♂.

27de Læsø Rende 1 ♀.

28de Lyngvig 1 ♂, Lodbjerg 2 ♂.

30te Skagen 2 (♂, ♀).

Maj: 3dje Lodbjerg 1 ♂, Hanstholm 3 (2 ♂, 1 ♀).

4de Graadyb 1.

September: 11te Vyl 1.

24de Graadyb 1 ♀ jun., Vyl 10 (6 ♂, 1 ♀ ad., 2 ♀ jun.), Lodbjerg 1 ♂ ad., Hanstholm 2, Anholt Knob 1.

25de Læsø Rende 1, Østre Flak 1, Schultz's Grund 1, Gedser Rev 1 ♂, Kjels Nor 2.

26de Østre Flak 1.

Oktober: 1ste Anholt 1 ♂ ad.

November: 21de Østre Flak 1 ♂ jun.

52. *Praticola rubetra.* Bynkefugl.

April: 27de Sejrø 1 ♂.

Maj: 13de Vyl 1 ♂.

17de Læsø Rende 1 ♂.

53. *Ruticilla phoenicura.* Rødstjert.

April: 27de Læsø Trindel 1 ♂.

Maj: 2den Lyngvig 1 ♂.

13de Vyl 2 ♂.

16de Vyl 1 ♂, Østre Flak 1 ♀.

August: 22de Lyngvig 1 ♂.

(1911.)

28de Rubjerg Knude 1 ♀, Hirtshals 1 ♂, Skagen 6 (3 ♂, 3 ♀), Læsø Trindel 1 ♂.

September: 24de Lodbjerg 2 (♀, ♂).

25de Østre Flak 1, Schultz's Grund 1, Kjels Nor 2, Gedser Rev 1.

27de Læsø Trindel 1 ♂ jun.

54. *Erithacus rubecula.* Rødkælk.

April: 1ste Anholt Knob 1 ♂, Hyllekrog 1.

23de Østre Flak 1, Anholt 3, Hyllekrog 1 ♀ jun.

24de Læsø Rende 1.

26de Schultz's Grund 4.

27de Læsø Trindel 1 ♀, Østre Flak 1 ♂, Anholt Knob 5 (2 ♂, 3 ♀), Sejrø 1.

28de Anholt Knob 1 ♂.

29de Østre Flak 1 ♀.

30te Læsø Trindel 2 ♀, Anholt Knob 1 ♀.

Maj: 3dje Læsø Rende 2 (♂, ♀).

September: 24de Vyl 2, Hanstholm 2, Læsø Trindel 1 ♀ jun.

25de Schultz's Grund 2, Kjels Nor 9, Gedser Rev 5.

26de Læsø Rende 1, Østre Flak 1, Anholt Knob 1.

30te Anholt Knob 1.

Oktober: 1ste Anholt 2 ♀ ad., Schultz's Grund 6.

11te Vyl 1.

20de Læsø Trindel 2 (♂, ♀ jun.).

24de Lyngvig 1 ♀ jun., Læsø Trindel 3 (1 ♂, 2 ♀).

25de Østre Flak 2 ♂.

27de Anholt Knob 1 ♂, Schultz's Grund 1 ♂ ad.

28de Kjels Nor 2.

29de Stevns 7 (3 ♀ jun., 2 ♂).

55. *Cyanecula suecica.* Blaakælk.

September: 26de Østre Flak 1 ♀ jun.

56. *Luscinia vera.* Sydlig Nattergal.

Maj: 25de Kjels Nor 1 ♀ ad.

(1911.)

57. *Muscicapa atricapilla.* Broget Fluesnapper.

April: 24de Skagen 1 ♂, Læsø Rende 3 ♂.
30te Skagen 1 ♂.
Maj: 3dje Lyngvig 1 ♂, Lodbjerg 1 ♂.
16de Østre Flak 1 ♀.
17de Læsø Rende 1 ♂.
25de Kjels Nor 1 ♂.
August: 28de Skagen 4 (16 faldt.).
September: 24de Vyl 1 ♀.
25de Kjels Nor 1.

58. *Muscicapa grisola.* Graa Fluesnapper.

Maj: 15de Skagen 1 ♂.
25de Lyngvig 1.

59. *Passer dometicus.* Spurv.

April: 30te Lyngvig 1 ♂.

60. *Passer montanus.* Skovspurv.

Oktober: 11te Anholt Knob 1.

61. *Fringilla coelebs.* Bogfinke.

Oktober: 9de Vyl 1 ♂ ad.
14de Vyl 1 ♀ jun.

62. *Fringilla montifringilla.* Kvækerfinke.

April: 23de Anholt 1 ♀, Hyllekrog 1 ♀.
24de Anholt 1.
28de Kjels Nor 1.
September: 24de Lodbjerg 1 ♀.
Oktober: 1ste Anholt 4 ♂ ad.
8de Lyngvig 1 ♀.
20de Læsø Trindel 2 ♂.
24de Lyngvig 1 ♂, Læsø Trindel 1 ♂.
25de Østre Flak 1 ♀, Anholt 1 ♀ ad.
27de Horns Rev 1 ♂, Lyngvig 1 ♂, Anholt 3 (2 ♂, 1 ♀).
28de Vyl 1 ♀.

(1911.)

63. *Cannabina linota.* Irisk.

Marts: 29de Vyl 1 ♀ ad.

Oktober: 15de Graadyb 1 ♂.

64. *Cannabina linaria.* Graasisken.

November: 19de Østre Flak 1 ♂.

65. *Emberiza schoeniclus.* Rørspurv.

April: 24de Læsø Rende 1 ♂.

30te Skagen 1 ♂.

September: 24de Anholt Knob 1.

Oktober: 1ste Anholt 7 (1 ♂, 1 ♀ jun., 5 ♀ ad.).

25de Anholt 2.

29de Stevns 1 ♂ jun.

66. *Emberiza citrinella.* Gulspurv.

Oktober: 20de Anholt Knob 1.

November: 20de Anholt 1 ♀ ad.

67. *Emberiza miliaria.* Bomlænke.

November: 29de Drogden 1 ♂.

30te Drogden 1 ♀ jun.

68. *Emberiza nivalis.* Snespurv.

Marts: 4de Hyllekrog 1 ♀ ad.

15de Vyl 2 ♀.

28de Lyngvig 1 ♀ jun.

Oktober: 25de Schultz's Grund 1 ♀ jun.

27de Anholt Knob 1 ♀ jun., Anholt 1.

28de Vyl 1 ♀, Lyngvig 1 ♂.

November: 15de Østre Flak 1 ♀.

19de Graadyb 1 ♀.

20de Anholt 2 ♂.

22de Schultz's Grund 1 ♂.

December: 9de Østre Flak 2 ♂.

Oversigt over de Nætter da Fugle ere komne til Fyrene.

Hver Nat henregnes til den følgende Dag. — Tallet efter Vindretningen betegner Vindstyrken efter Beauforts Skala (0—12), hvor

1	**betyder:**	**Let Brise.**	**7**	**betyder:**	**Trerebet Merssejlskuling.**
2	**—**	**: Laber Bramsejlskuling.**	**8**	**—**	**: Klosrebet Merssejlskuling.**
3	**—**	**: Bramsejlskuling.**	**9**	**—**	**: Undersejlskuling el. Storm.**
4	**—**	**: Merssejlskuling.**	**10**	**—**	**: Haard Storm.**
5	**—**	**: Rebet Merssejlskuling.**	**11**	**—**	**: Orkanagtig Storm.**
6	**—**	**: Torebet Merssejlskuling.**	**12**	**—**	**: Orkan.**

8de Januar.

Lodbjerg. S. 3, overtr., diset. 1 Stær ved Ruderne om Morgenen.

Sprogø. S. V. 3, diset. En Stor Stormsvale faldt.

Kjels Nor. S., S. V. 2, skyet og diset. En Lærke faldt.

Procellaria leucorrhoa. Sprogø 1.
Alauda arvensis. Kjels Nor 1.

13de Januar.

Bovbjerg. N. Ø., skyet og diset. En Stær ved Fyret om Natten.

21de Januar.

Lyngvig. V. S. V. 3, overtrukket. En Stær ved Fyrruderne.

Lodbjerg. S. Ø. 2, klart. En Lærke ved Ruderne før Midnat.

26de Januar.

Vyl. V. S. V. 5, Regn. En Lærke fandtes død paa Dækket om Morgenen.
Alauda arvensis 1.

27de Januar.

Blaavandshuk. V., Regntykning. 1 Stær og 1 Drossel faldt (ikke indsendte.).

Vyl. V. N. V. 3, Regn. Flere Lærker saas om Natten, 4 faldt.

Horns Rev. V., overtr. Omkr. 80 Lærker ved Fyret om Natten.

Lyngvig. V. 3, overtr. Stære og Lærker om Fyret. 10 Lærker faldt.

Alauda arvensis. Vyl 4, Lyngvig 1 (10 faldt.).
(*Sturnus vulgaris.* Blaavandshuk 1.).

28de Januar.

Vyl. V. N. V. 3, skyet. Enkelte Lærker ved Fyret om Natten, 1 faldt.

Lodbjerg. V. 3, overtr., diset. 2 Stære ved Ruderne efter Midnat.

Alauda arvensis. Vyl 1.

(1911.)

30te Januar.

Vyl. Ø. S. Ø. 3, skyet. Enkelte Lærker om Fyret, 2 faldt.

Alauda arvensis 2.

3dje Februar.

Læsø Trindel. N. N. V. 2, Taage. Fugle ved Fyret.

7de Februar.

Vyl. N. N. V. 4, Regnbyger. En Lærke faldt.

Alauda arvensis 1.

18de Februar.

Vyl. S. V. 3, graat. Flere Smaaflokke Lærker ved Fyret om Morgenen; en Lærke faldt.

Horns Rev. V., Regn. Omkr. 50 Lærker ved Fyret om Natten, 2 faldt.

Alauda arvensis. Vyl 1, Horns Rev 2.

19de Februar.

Horns Rev. V., Regn. Enkelte Fugle ved Fyret om Natten.

Vestborg. S. Ø., diset. En Stær faldt (ikke indsendt.).

Lappegrunden. S. Ø. 2, overtrukket, Regn. En Lærke faldt.

Alauda arvensis. Lappegrunden 1.
(*Sturnus vulgaris.* Vestborg 1.)

20de Februar.

Østre Flak. S. S. Ø. 1, Snebyger. Flere Lærker saas ved Fyret i Løbet af Natten; 2 faldt.

Gedser Rev. V. 4, Regndis. 2 Lærker ved Fyret.

Alauda arvensis. Østre Flak 2.

21de Februar.

Gedser Rev. N. V. 5, Snevejr. En Lærke ved Fyret.

22de Februar.

Gedser Rev. V. S. V. 4, Snevejr. 3 Stære ved Fyret, 1 faldt paa Dækket (ikke indsendt.).

(*Sturnus vulgaris* 1.)

23de Februar.

Læsø Trindel. S. V. 5, Regnbyger. Smaafugle — Lærker og Stære — om Fyret, endel faldt i Vandet; 1 Lærke faldt paa Dækket.

Alauda arvensis 1.

(1911.)

24de Februar.

Lodbjerg. 6, overtr., Regn, Dis. En Lærke og 2 Stære ved Ruderne efter Midnat.

Læsø Rende. V. 4, Regnbyger. 2 Lærker faldt.

Østre Flak. S. V. 3, overtr. Flere Lærker saas ved Fyret; 4 faldt.

Anholt. S. V. 6, overtr., Regn. Enkelte Lærker ved Fyret; ingen faldt.

Gedser Rev. S. V. 5, Regn. En Vibe ved Fyret.

Alauda arvensis. Læsø Rende 2, Østre Flak 4.

25de Februar.

Graadyb. S. Ø. 3, Regn. Flere Fugle ved Fyret. En Stær faldt.

Læsø Trindel. S. S. Ø. 4, Regn og Sne. Smaafugle om Fyret; en Lærke faldt.

Læsø Rende. N. V. 5, Snebyger. Flere Smaafugle ved Fyret; 2 Lærker faldt.

Østre Flak. N. V. 1, skyet. En Lærke faldt.

Alauda arvensis. Læsø Trindel 1, Læsø Rende 2, Østre Flak 1.

Sturnus vulgaris. Graadyb 1.

26de Februar.

Vyl. V. S. V. 3, Regn. Endel Lærker og Stære ved Fyret om Natten; 1 Solsort faldt.

Horns Rev. N. V. Skyet. Enkelte Fugle ved Fyret om Natten; 1 Stær og 1 Sjagger faldt.

Bovbjerg. S., Sne og Regn. Nogle Stære ved Fyret.

Lodbjerg. S. S. Ø. senere V. N. V., 4, overtr., Regn, Sne og Dis. Mange Stære ved Ruderne efter Midnat.

Læsø Rende. S. 3, Regn, Snebyger. 5 Lærker faldt.

Østre Flak. S. 2, Regn. En stor Flok Lærker fløj omkring Skibet, da det blev Dag; 2 Lærker faldt.

Anholt Knob. S. S. Ø. 4, Regn og Sne. Enkelte Lærker ved Fyret og omkring Skibet.

Schultz's Grund. S. 3, Sne. 5 Lærker faldt.

Sejrø. S. S. Ø. henad Morgen V. S. V., Snetykning, Regn, diset og overtrukket. Store Fugletræk; Lærker og Stære paa og omkring Fyret; omkring 60 Lærker og 2 Stære faldt (ikke indsendte).

Vestborg. S., Regn. 1 Lærke faldt (ikke indsendt).

Sprogø. En Lærke paa Fyrets Ruder.

Ælelø. S. V. Overtrukket, Regn. Endel Lærker og Stære paa Ruderne; 6 Lærker faldt (ikke indsendte.).

Gedser Rev. V. 3, Regn. Omkr. 25 Lærker ved Fyret; 1 faldt (ikke indsendt.).

Alauda arvensis. Læsø Rende 5, Østre Flak 2, Schultz's Grund 5, (Sejrø 60).
Sturnus vulgaris. Horns Rev 1, (Sejrø 2).
Turdus pilaris. Horns Rev 1.
Turdus merula. Vyl 1.

28de Februar.

Vyl. S. S. V. 4, Regn. En Stær faldt.
Sturnus vulgaris 1.

1ste Marts.

Graadyb. S. V. 4, Regn. Mange Smaafugle og Viber ved Fyret; 2 Sortænder og 1 Stær faldt.

Blaavandshuk. V. S. V. 5, Regntykning. 1 Stær faldt (ikke indsendt.).

Lyngvig. S. V. 3, overtrukket. Endel Stære om Fyret; 1 faldt.

Bovbjerg. S. V. 3, Taage. En hel Del Stære ved Fyret om Natten.

Lodbjerg. S. V. 5, overtrukket, Taage. Enkelte Viber i Nærheden af Taarnet efter Midnat; nogle Stære ved Ruderne efter Midnat.

Læsø Trindel. S. V. 4, Regn. Fugle om Fyret; 1 Lærke, 1 Stær og 1 Solsort faldt.

Kjels Nor. S. V. 4, Regnbyger. 1 Vibe faldt.

Ælelø. S. V. Regn. Endel Stære paa Ruderne; ingen faldt.
Oedemia nigra. Graadyb 2.
Vanellus cristatus. Kjels Nor 1.
Alauda arvensis. Læsø Trindel 1.
Sturnus vulgaris. Graadyb 1, (Blaavandshuk 1.), Lyngvig 1 (4 faldt.), Læsø Trindel 1.
Turdus merula. Læsø Trindel 1.

2den Marts.

Vyl. V. S. V. 4, Regn. En Stær faldt.

Lyngvig. V. S. V. 6, Regn. Mange Stære om Fyret; 11 faldt.

Bovbjerg. V. 7, skyet, Dis. En hel Del Stære ved Fyret om Natten.

(1911.)

Lodbjerg. V. S. V. 7, overtrukket, Regn og Dis. Mange Stære ved Ruderne efter Midnat; 9 faldt.

Læsø Rende. V. 4, Regnbyger. Flere Stære ved Fyret, 1 faldt (ikke indsendt.).

Østre Flak. V. S. V. 3, Regn. 3 Lærker og 1 Stær faldt.

Anholt Knob. V. 5, overtrukket, Regn. Enkelte Lærker og Solsorter ved Fyret og omkring Skibet.

Anholt. V. 7, overtrukket. Endel Lærker og Solsorter omkring Ruderne; ingen faldt.

Schultz's Grund. S. V. 4, Regn. 2 Stære faldt.

Alauda arvensis. Østre Flak 3.
Sturnus vulgaris. Vyl 1, Lyngvig 1 (11 faldt.), Lodbjerg 9, (Læsø Rende 1), Østre Flak 1, Schultz's Grund 2.

3dje Marts.

Graadyb. N. V. 8, Byger. En Stær faldt.

Læsø Trindel. V. 3, Taage. Fugle om Fyret; en Lærke og en Stær faldt.

Alauda arvensis. Læsø Trindel 1.
Sturnus vulgaris. Læsø Trindel 1, (Graadyb 1.).

4de Marts.

Graadyb. S. V. 3, Regn og Taage. Mange Fugle ved Fyret, deriblandt Stære, Lærker og Strandskader; Fugletræk saas ustandseligt; 1 Lærke, 1 Stær og 1 Solsort faldt.

Blaavands Huk. V. S. V. 2, Taage. En Flok Viber ved Fyret; 1 faldt (ikke indsendt.).

Vyl. V. 2, Taage. Endel Lærker og Stære om Fyret; 2 Stære faldt.

Lodbjerg. V. 4, overtrukket, Dis. Mange Stære ved Ruderne før og efter Midnat.

Anholt Knob. S. V. 4, Regn og Taage. Lærker saas ved Fyret; 3 faldt.

Hjelm. V. 3, Taage. Endel Lærker og Stære ved Ruderne; 2 Lærker og 1 Stær faldt.

Thunø. S. V. 2, Taage. En Stær faldt.

Gedser Rev. S. V. 2, Taage. 10 Lærker faldt.

(1911.)

Hyllekrog. V. 3, Taage. Nogle Smaafugle ved Ruderne; 1 Hedelærke og 1 Snespurv faldt.

Alauda arvensis. Graadyb 1, Anholt Knob 1 (3 faldt.), Hjelm 2, Gedser Rev 5.
Alauda arborea. Hyllekrog 1.
Sturnus vulgaris. Graadyb 1, Vyl 2, Hjelm 1, Thunø 1.
Turdus merula. Graadyb 1.
Emberiza nivalis. Hyllekrog 1.

5te Marts.

Graadyb. V. N. V. 3, Regnbyger. En Lærke faldt.
Alauda arvensis 1.

8de Marts.

Kjels Nor. S. 3, Regnbyger. 1 Lærke, 2 Stære og 1 Solsort faldt.
Alauda arvensis 1.
Sturnus vulgaris 2.
Turdus merula 1.

9de Marts.

Graadyb. En Stær faldt.
Sturnus vulgaris 1.

14de Marts.

Graadyb. Ø. 3, Regnbyger. En Lærke faldt.
Alauda arvensis 1.

15de Marts.

Vyl. S. Ø 3, Regn. Enkelte Lærker saas ved Fyret; 2 Snespurve faldt.
Emberiza nivalis 2.

17de Marts.

Vyl. Ø. 4, skyet. En Lærke faldt.
Alauda arvensis 1.

23de Marts.

Gedser Rev. Ø. 3, overtrukket. 15 Lærker, 5 Stære og 1 Spurvehøg ved Fyret; 1 Stær og 2 Lærker faldt paa Dækket (ikke indsendte).
Hyllekrog. Ø. N. Ø. 2, overtrukket. Mange Stære paa Ruderne.
Sturnus vulgaris. (Gedser Rev 1).

28de Marts.

Vyl. Ø. 2, graat. Endel Fugle ved Fyret om Natten, deriblandt Viber, Lærker samt Raager, der sad i Rigningen; en Vibe faldt og gik om paa Dækket til det blev Dag, da den atter fløj bort; 1 Lærke faldt.

Lyngvig. Ø. 2, overtrukket. Viber og Stære om Fyret; 2 Viber, 1 Horsegøg og 1 Snespurv faldt.

Vanellus cristatus. Lyngvig 1 (2 faldt.).
Gallinago scolopacina. Lyngvig 1.
Alauda arvensis. Vyl 1.
Emberiza nivalis. Lyngvig 1.

29de Marts.

Vyl. Ø. N. Ø. 2, graat. Endel Fugle ved Fyret om Natten; Lærker og Viber kendtes; en Irisk faldt.

Læsø Rende. N. Ø. 2, skyet. En ubekendt Fugl faldt, ikke indsendt.

Sprogø. N. Ø. 3, Taage. En Rørhøne og en Lærke (ikke indsendt) faldt.

Gallinula chloropus. Sprogø 1.
Cannabina linota. Vyl 1.

30te Marts.

Vyl. Ø. S. Ø. 3, Taage. 1 Stær faldt.
Sturnus vulgaris 1.

1ste April.

Anholt Knob. S. Ø. 2, skyet. En Rødkælk faldt.

Anholt. Ø. S. Ø. 4, overtrukket. Endel Solsorter og Drosler ved Ruderne; ingen faldt.

Kjels Nor. Ø. S. Ø. senere V. 2, Taage. En Ringdue faldt.

Hyllekrog. Mellem S. Ø. og S. V. Flovt og Taage. Mange Smaafugle paa Ruderne, Drosler, Stære og Rødkælke. En Sangdrossel og en Rødkælk faldt.

Columba palumbus. Kjels Nor 1.
Turdus musicus. Hyllekrog 1.
Erithacus rubecula. Anholt Knob 1, Hyllekrog 1.

2den April.

Vyl. Stille, Taage. En Engpiber faldt.

(1911.)

Lyngvig. Stille, overtrukket, diset. Mange Viber, Hjejler og Regnspover om Fyret; 12 Viber faldt.

Lodbjerg. S. V. 2, Taage. Enkelte Stære og 1 Rødkælk ved Ruderne efter Midnat.

Hov. S. Ø. 2, diset og Taage. En Stær faldt.

Kjels Nor. Ø. senere V. S. V. 2, Taage. 1 Rørvagtel, 4 Stære og 1 Gærdesmutte faldt.

Porzana maruetta. Kjels Nor 1.
Vanellus cristatus. Lyngvig 1 (12 faldt).
Sturnus vulgaris. Hov 1, Kjels Nor 4.
Troglodytes parvulus. Kjels Nor 1.
Anthus pratensis. Vyl 1.

3dje April.

Graadyb. N. N. Ø. 7, klart. Mange Stære omkring Skibet; 2 faldt.

Sturnus vulgaris 2.

4de April.

Graadyb. N. Ø. 5, klart. Mange Stære omkring Skibet; 3 faldt.

Sturnus vulgaris 3.

16de April.

Anholt Knob. V. 4, Regn. 1 Stær faldt.

Sturnus vulgaris 1.

18de April.

Lodbjerg. S. S. Ø. 3, skyet. 2 Stære og 1 Fuglekonge ved Ruderne efter Midnat.

Hanstholm. S. Ø. 2, overtrukket. Endel Solsorter og enkelte Drosler flagrede om Fyret fra Kl. 11 til Daggry.

Skagen. S. S. V. 4, diset. Store Mængder af Stære, Drosler, Rødbryste, Kongefugle og 1 Skovsneppe ved Ruderne; 1 Stær, 1 Solsort og 1 Drossel faldt (ikke indsendte).

Skagens Rev. S. Ø. 2, overtrukket. En Mængde Smaafugle vare ved Fyret om Natten; enkelte faldt i Vandet.

Anholt Knob. S. 3, overtrukket, Regn. Enkelte Smaafugle saas ved Fyret og nogle opholdt sig paa Skibet.

(1911.)

19de April.

Lodbjerg. S. Ø. 3, overtrukket, Dis. 1 Solsort og 1 Fuglekonge ved Ruderne efter Midnat.

20de April.

Schultz's Grund. S. S. V. 2, Regn. 16 Sangdrosler faldt.

Turdus musicus 2 (16 faldt).

21de April.

Skagen. V. 3, diset. Endel Stære, Drosler, Rødbryste, Digesmutter m. fl. paa Ruderne; 1 Drossel faldt (ikke indsendt.).

Læsø Trindel. S. V. 3, overtrukket. Enkelte Fugle ved Fyret.

Omø. N. V. til V. 2, skyet. 2 Sortænder faldt.

Oedemia nigra. Omø 2.

22de April.

Graadyb. S. V. 4, overtrukket. En Sjagger faldt, ellers ingen Fugle ved Fyret.

Vyl. S. V. 3, graat. Nogle Smaafugle vare ved Fyret om Natten; 1 faldt i Vandet, 2 Sangdrosler faldt paa Dækket.

Lyngvig. S. V. 4, diset. Hjejler og Drosler om Fyret; en Vandrikse, en Hjejle og 2 Sjaggere faldt.

Læsø Rende. S. V. 3, overtrukket. 4 Sangdrosler faldt.

Hesselø. V. S. V. 4. 1 Vandhøne og 2 Sjaggere faldt (intet indsendt.).

Kjels Nor. S. V. 3, overtrukket. 1 Enkelt Bekkasin, 2 Sangdrosler og 2 Vindrosler faldt.

Rallus aquaticus. Lyngvig 1.
Limnocryptes gallinula. Kjels Nor 1.
Charadrius pluvialis. Lyngvig 1.
Turdus iliacus. Kjels Nor 2.
Turdus musicus. Vyl 1 (2 faldt), Læsø Rende 4, Kjels Nor 2.
Turdus pilaris. Graadyb 1, Lyngvig 1 (2 faldt).

23de April.

Graadyb. S. V. 3, Regnbyger. Smaafugle om Fyret; 1 Sangdrossel og 2 Stenpikkere faldt.

Vyl. S. V. 3, Regn. Endel Fugle ved Fyret om Natten; 1 Stær, 6 Sangdrosler og 2 Stenpikkere faldt; flere Fugle faldt i Vandet.

(1911.)

Lyngvig. S. V. 3, overtrukket. En Storspove faldt.

Rubjerg Knude. S. V. 4. Mange Regnspover om Fyret.

Læsø Trindel. V. S. V. 3, skyet. Enkelte Fugle ved Fyret; 1 Sangdrossel faldt.

Østre Flak. S. V. 2, overtrukket. En Rødkælk faldt.

Anholt Knob. S. V. 3, overtrukket. En Sangdrossel faldt.

Anholt. S. V. 4, diset. 2 Stære, 1 Jernspurv, 32 Sjaggere, 1 Ringdrossel, 1 Stenpikker, 3 Rødkælke og 1 Kvæker faldt.

Hesselø. V. S. V. 4. 1 Skovdue og 5 Vindrosler faldt (intet indsendt).

Sejrø. S. V. Regn, diset, af og til Taage. Endel Fugle omkring Ruderne; 4 Vindrosler og 1 Rødkælk faldt (intet indsendt).

Æbelø. S. V. Regnbyger og diset. Endel Drosler og mindre Fugle paa Ruderne; 4 Fugle faldt.

Hyllekrog. S. V. Flovt, diset. Endel Smaafugle paa Ruderne i Nattens Løb; 1 Rødkælk og 1 Kvæker faldt.

Numenius arquatus. Lyngvig 1.
Iynx torquilla. Æbelø 1.
Sturnus vulgaris. Vyl 1, Anholt 1 (2 faldt.).
Accentor modularis. Anholt 1.
Turdus musicus. Graadyb 1, Vyl 1 (6 faldt.), Læsø Trindel 1, Anholt Knob 1, Æbelø 1.
Turdus pilaris. Anholt 1 (32 faldt.).
Turdus torquatus. Anholt 1.
Saxicola oenanthe. Graadyb 2, Vyl 2, Anholt 1.
Erithacus rubecula. Østre Flak 1, Anholt 3, Hyllekrog 1.
Fringilla montifringilla. Anholt 1, Hyllekrog 1.

24de April.

Vyl. S. V. 3, Regnbyger. Enkelte Fugle ved Fyret om Natten; 2 faldt i Vandet.

Skagen. V. S. V. 4, Regn, diset. Store Mængder af Regnspover, Stære, Drosler m. fl. kredsede om Fyret og fløj mod Ruderne; 1 Storspove, 10 Drosler og 1 Broget Fluesnapper faldt.

Læsø Trindel. V. S. V. 3, Regnbyger. Endel Fugle ved Fyret; 8 Sangdrosler, 1 Solsort og 1 Ringdrossel faldt.

Læsø Rende. V. 5, Regnbyger. 3 Brogede Fluesnappere, 1 Stenpikker, 1 Rødkælk og 1 Rørspurv faldt.

(1911.)

Østre Flak. S. V. 2, overtrukket, Regn. Flere Fugle ved Fyret; 1 Vindrossel og 1 Sangdrossel faldt.

Anholt. S. V. 5, Dis og Regn. 1 Vendehals, 2 Lærker, 19 Sangdrosler, 6 Sjaggere, 1 Stenpikker og 1 Kvæker faldt; mange Fugle faldt i Søen.

Sprogø. V. S. V. 3, diset. 3 Vindrosler faldt (ikke indsendte.).

Numenius arquatus. Skagen 1.
Iynx torquilla. Anholt 1.
Alauda arvensis. Anholt 2.
Turdus iliacus. Skagen 2, Østre Flak 1.
Turdus musicus. Skagen 2, Østre Flak 1, Anholt 2 (19 faldt.).
Turdus pilaris. Skagen 1, Anholt 1 (6 faldt.).
Turdus merula. Læsø Trindel 1.
Turdus torquatus. Læsø Trindel 1.
Saxicola oenanthe. Læsø Rende 1, Anholt 1.
Erithacus rubecula. Læsø Rende 1.
Muscicapa atricapilla. Skagen 1, Læsø Rende 3.
Fringilla montifringilla. Anholt 1.
Emberiza schoeniclus. Læsø Rende 1.

25de April.

Lodbjerg. V. N. V. 2, overtrukket, Dis. 1 Lærke og 1 Solsort ved Ruderne om Morgenen.

Hesselø. V. S V. 2. 1 Sjagger og 4 Vindrosler faldt (intet indsendt.).

26de April.

Graadyb. S. V. 3, Regn. Nogle Fugle om Fyret; 1 Sjagger og 1 Stenpikker faldt.

Vyl. S. V. 2, Regn. Endel Fugle ved Fyret om Natten; 6 Sangdrosler og 2 Stenpikkere faldt.

Hanstholm. S. 2, Regndis. Nogle Regnspover hørtes omkring Fyret Kl. 12.

Nordre Rønner. S. 3, Regndis. 1 Vindrossel og 1 Lærke faldt (ikke indsendte).

Hesselø. V. 4. 6 Vindrosler faldt (ikke indsendte.).

Schultz's Grund. V. S. V. 2, Taage. 1 Vandrikse, 2 Lærker, 1 Løvsanger, 1 Fuglekonge, 4 Sangdrosler og 4 Rødkælke faldt.

Sejrø. V. S. V. Overtrukket og diset; af og til Taage. Endel Drosler og Smaafugle omkring Ruderne.

(1911.)

Vestborg. S. Dis. 2 Vindrosler faldt (ikke indsendte.)

Hammeren. S. V. 4, Taage og Regn. 1 Skovsneppe faldt.

Rallus aquaticus. Schultz's Grund 1.
Scolopax rusticula. Hammeren 1.
Alauda arvensis. Schultz's Grund 2.
Phyllopseustes trochilus. Schultz's Grund 1.
Regulus cristatus. Schultz's Grund 1.
Turdus musicus. Vyl 1 (6 faldt), Schultz's Grund 2 (4 faldt.).
Turdus pilaris. Graadyb 1.
Saxicola oenanthe. Graadyb 1, Vyl 2.
Erithacus rubecula. Schultz's Grund 4.

27de April.

Skagen. S. 3, Regn. Store Mængder af Regnspover, Drosler o. fl. a. kredsede om Fyret; 1 Vandrikse, 1 Mudderklire og 20 Sangdrosler faldt.

Nordre Røn. V. 4, Regnbyger. Flere Stære om Fyret.

Læsø Trindel. V. 3, Regntykning. Endel Fugle ved Fyret; 7 Sjaggere (Sangdrosler?), 1 Rødstjert og 1 Rødkælk faldt.

Læsø Rende. S. og V. 5, Regn. 1 Vendehals, 1 Vindrossel, 1 Sangdrossel og 1 Stenpikker faldt.

Østre Flak. S. S. V. 3, overtrukket og Regn. Mange Fugle saas ved Fyret; 1 Vendehals, 4 Sangdrosler, 1 Ringdrossel og 1 Rødkælk faldt.

Anholt Knob. V. 4, overtrukket, Regn; 15 Fugle faldt, 1 Vindrossel, 1 Sjagger og 5 Rødkælke indsendtes; mange faldt udenbords.

Hesselø. S. V. 3. 3 Vindrosler faldt (ikke indsendte.).

Fornæs. V. S. V. 3, Regn. Enkelte Drosler omkring Fyret; 3 faldt (ikke indsendte.).

Sejrø. V. N. V. Overtrukket. Nogle Fugle ved Ruderne hele Natten; 1 Vendehals, 2 Vindrosler, 1 Solsort, 1 Bynkefugl og 1 Rødkælk faldt.

Lappegrunden. S. V. 2, Regn. Endel Smaafugle ved Fyret.

Sprogø. Mange Smaafugle paa Ruderne.

Omø. V. til N. 3, skyet og Regn. 1 Vindrossel, 1 Sjagger og 1 Solsort faldt.

Rallus aquaticus. Skagen 1.
Actitis hypoleuca. Skagen 1.

(1911.)

Iynx torquilla. Læsø Rende 1, Østre Flak 1, Sejrø 1.
Turdus iliacus. Læsø Rende 1, Anholt Knob 1, Sejrø 2, Omø 1.
Turdus musicus. Skagen 1 (20 faldt), Læsø Rende 1, Østre Flak 4.
Turdus pilaris. Anholt Knob 1, Omø 1.
Turdus merula. Sejrø 1, Omø 1.
Turdus torquatus. Østre Flak 1.
Saxicola oenanthe. Læsø Rende 1.
Praticola rubetra. Sejrø 1.
Ruticilla phoenicura. Læsø Trindel 1.
Erithacus rubecula. Læsø Trindel 1, Østre Flak 1, Anholt Knob 5, Sejrø 1.

28de Aqril.

Lyngvig. N. Ø. 2, overtrukket. Endel Smaafugle om Fyret; 1 Rørvagtel, 1 Ryle og 1 Stenpikker faldt.

Lodbjerg. S. S. V. senere Ø. 2, overtr., Dis. 1 Ringdrossel og nogle Stenpikkere ved Ruderne om Natten; 2 Stenpikkere faldt.

Hanstholm. S. V. 2, Regndis. Nogle Ringdrosler, Vindrosler og Solsorter samt nogle Strandskader om Fyret fra Kl. 11 til Daggry.

Anholt Knob. S. S. V. 3, overtr., Regn. Enkelte Fugle ved Fyret; 1 Rødkælk faldt.

Schultz's Grund. V. 2, Regn. 10 Sangdrosler faldt paa Dækket, mange udenbords.

Vestborg. Ø. Regn. 1 Stær og 1 Vindrossel faldt (ikke indsendte.).

Stevns. S. 2, Regntykning. 1 Vindrossel, 1 Sangdrossel, 1 Sjagger og 1 Misteldrossel faldt.

Kjels Nor. S. 4, Regndis. 1 Vandrikse, 1 Enkelt Bekkasin, 1 Sivsanger, 9 Sangdrosler, 1 Sjagger og 1 Kvæker faldt.

Porzana maruetta. Lyngvig 1.
Rallus aquaticus. Kjels Nor 1.
Tringa alpina. Lyngvig 1.
Limnocryptes gallinula. Kjels Nor 1.
Sturnus vulgaris. (Vestborg 1.).
Acrocephalus phragmitis. Kjels Nor 1.
Turdus iliacus. Stevns 1.
Turdus musicus. Schultz's Grund 4 (10 faldt), Stevns 1, Kjels Nor 9.
Turdus pilaris. Stevns 1, Kjels Nor 1.
Turdus viscivorus. Stevns 1.
Saxicola oenanthe. Lyngvig 1, Lodbjerg 2.
Erithacus rubecula. Anholt Knob 1.
Fringilla montifringilla. Kjels Nor 1.

(1911.)

29de April.

Lodbjerg. V. S. V. 3, overtr., diset. Nogle Drosler og Stære ved Ruderne; 1 Præstekrave, 2 Sangdrosler og 1 Ringdrossel faldt.

Hanstholm. S. V. 2, Regn. Nogle Regnspover, Strandskader og Solsorter samt Ænder om Fyret fra Kl. 11 til Kl. 3; 1 Rørvagtel, 1 Ringdrossel og 1 Solsort faldt.

Østre Flak. S. V. 2, overtrukket. 1 Fuglekonge, 1 Sangdrossel, 3 Sjaggere og 1 Rødkælk faldt; mange faldt i Søen.

Fornæs. V. 3, Regn. Mange Drosler omkring Fyret; 24 faldt. 1 Skovdue faldt (ikke indsendt.).

Hyllekrog. V. og V. N. V., flovt. En lille Lappedykker faldt.

Tachybaptes minor. Hyllekrog 1.
Porzana maruetta. Hanstholm 1.
Ægialitis hiaticula. Lodbjerg 1.
Regulus cristatus. Østre Flak 1.
Turdus musicus. Lodbjerg 2, Østre Flak 1.
Turdus pilaris. Østre Flak 3.
Turdus torquatus. Lodbjerg 1, Hanstholm 1.
Turdus merula. Hanstholm 1.
Erithacus rubecula. Østre Flak 1.

30te April.

Lyngvig. S. S. V. 3, overtrukket. En Spurv faldt.

Lodbjerg. S. S. V. 3, overtrukket, diset. 1 Drossel og 1 Stenpikker ved Ruderne før Midnat; flere Drosler, Stenpikkere og Fluesnappere ved Ruderne efter Midnat.

Skagen. S. S. V. 3, overtrukket. Endel Drosler, Rødbryste, Rødstjerte o. fl. a. paa Ruderne; 20 Sangdrosler, 4 Sjaggere, 2 Stenpikkere, 1 Broget Fluesnapper og 1 Rørspurv faldt.

Læsø Trindel. S. V. 2, Regn og overtrukket. Endel Fugle ved Fyret; 6 Sjaggere (Sangdrosler?) og 2 Rødkælke faldt.

Anholt Knob. V. 4, overtrukket, Regnbyger. Enkelte Smaafugle ved Fyret; en Rødkælk faldt.

Ælø. S. V. 3, diset og Regn. Endel Kramsfugle samt andre Smaafugle paa Ruderne; 1 Enkelt Bekkasin faldt.

Limnocryptes gallinula. Ælø 1.
Turdus musicus. Skagen 1 (20 faldt.).

Turdus pilaris. Skagen 1 (4 faldt.).
Saxicola oenanthe. Skagen 2.
Erithacus rubecula. Læsø Trindel 2. Anholt Knob 1.
Muscicapa atricapilla. Skagen 1.
Passer domesticus. Lyngvig 1.
Emberiza schoeniclus. Skagen 1.

1ste Maj.

Skagen. V. 3, byget. Flere Slags Smaafugle paa Ruderne.

2den Maj.

Lyngvig. V. 2, skyet. 4 Sangdrosler og 1 Rødstjert faldt.

Kjels Nor. S. Ø. 3, overtrukket, Regn. 1 Munk faldt.

Sylvia atricapilla. Kjels Nor 1.
Turdus musicus. Lyngvig 1 (4 faldt.).
Ruticilla phoenicura. Lyngvig 1.

3dje Maj.

Blaavands Huk. S. S. Ø. 1, Regntykning. 2 Drosler faldt (ingen indsendt.).

Vyl. S. V. 3, Regn. Endel Fugle om Fyret; 1 Ringdrossel faldt.

Lyngvig. S. Ø. 2, Regn. 1 Horsegøg og 1 Broget Fluesnapper faldt.

Lodbjerg. S. 3, Regn, Dis. Drosler, Fluesnappere, Stære, Lærker og Stenpikkere ved Ruderne om Natten; 1 Vendehals, 1 Broget Fluesnapper, 1 Sangdrossel og 1 Stenpikker faldt.

Hanstholm. S. 2, Regn. Endel Sangdrosler, Ringdrosler og andre Smaafugle om Fyret fra Kl. 11 til Daggry; 1 Vendehals, 2 Sangdrosler og 3 Stenpikkere faldt.

Læsø Rende. S. 3, Regnbyger. 2 Rødkælke faldt.

Sprogø. S. 3, diset. 1 Rødkælk faldt (ikke indsendt.).

Kjels Nor. S. S. Ø. 3, overtrukket; 1 Vendehals faldt.

Gallinago scolopacina. Lyngvig 1.
Iynx torquilla. Lodbjerg 1, Hanstholm 1, Kjels Nor 1.
Turdus musicus. Lodbjerg 1, Hanstholm 2.
Turdus torquatus. Vyl 1.
Saxicola oenanthe. Lodbjerg 1, Hanstholm 3.
Erithacus rubecula. Læsø Rende 2.
Muscicapa atricapilla. Lyngvig 1, Lodbjerg 1.

4de Maj.

Graadyb. S. S. V. 4, Regn. Mange Fugle om Skibet; 1 Stenpikker faldt.

(1911.)

Lodbjerg. S. S. V. 6, overtrukket, Dis, Regn. 1 Stær og 1 Fluesnapper ved Ruderne efter Midnat.

Skagen. S. 5, overtrukket. 2 Vindrosler, 1 Vadefugl o. fl. a. paa Ruderne; 2 Drosler, 1 Rørvagtel og 1 Horsegøg faldt.

Porzana maruetta. Skagen 1.
Gallinago scolopacina. Skagen 1.
Saxicola oenanthe. Graadyb 1.

5te Maj.

Anholt Knob. Stille, skyet. Flokke af Regnspover trak forbi Skibet om Natten.

13de Maj.

Vyl. Stille, klart. 1 Bynkefugl og 2 Rødstjerte faldt.

Praticola rubetra. Vyl 1.
Ruticilla phoenicura. Vyl 2.

15de Maj.

Graadyb. S. 2, Regnbyger. 1 Rødben faldt.

Skagen. Ø. S. Ø. 4, Regn. Endel Rødstjerte, Digesmutter o. a. Smaafugle paa Ruderne; 1 Vendehals, 1 Tornsanger og 1 Graa Fluesnapper faldt.

Totanus calidris. Graadyb 1.
Iynx torquilla. Skagen 1.
Sylvia cinerea. Skagen 1.
Muscicapa grisola. Skagen 1.

16de Maj.

Vyl. V. 2, Taage. En Rødstjert faldt.

Østre Flak. S. Ø. 1, overtr. og Regn. 1 Løvsanger, 1 Broget Fluesnapper og 1 Rødstjert faldt.

Phyllopseustes trochilus. Østre Flak 1.
Muscicapa atricapilla. Østre Flak 1.
Ruticilla phoenicura. Vyl 1, Østre Flak 1.

19de Maj.

Læsø Rende. S. 2, byget. En Bynkefugl og 1 Broget Fluesnapper faldt.

Praticola rubetra. Læsø Rende 1.
Muscicapa atricapilla. Læsø Rende 1.

24de Maj.

Skagen. S. V. 3, overtrukket. Flere Smaafugle kredsede om Taarnet.

25de Maj.

Lyngvig. V. 2, Taage. Endel Smaafugle om Fyret; 1 Graa Fluesnapper faldt.

Sejrø. S. Ø. Regntykning. Endel Smaafugle ved Ruderne.

Vestborg. S. Taage. 1 Kongefugl, 2 Havesangere og 1 Gærdesmutte faldt (intet indsendt.).

Kjels Nor. S. 2, Regndis. 1 Munk, 2 Havesangere, 1 Rørsanger, 1 Løvsanger, 1 Sydlig Nattergal og 1 Broget Fluesnapper faldt.

Hyllekrog. S. Ø. Flovt og Regntykning. Mange Smaafugle paa Ruderne; 1 Gulbug faldt.

Sylvia atricapilla. Kjels Nor 1.
Sylvia hortensis. Kjels Nor 2.
Hypolais icterina. Hyllekrog 1.
Acrocephalus arundinaceus. Kjels Nor 1.
Phyllopseustes trochilus. Kjels Nor 1.
Luscinia vera. Kjels Nor 1.
Muscicapa grisola. Lyngvig 1.
Muscicapa atricapilla. Kjels Nor 1.

24de Juli.

Omø. Stille, skyet. En Brevdue faldt.

Columba livia dom. 1.

21de August.

Nakkehoved. N. Ø. 3, diset. 1 Vendehals faldt.

Iynx torquilla 1.

22de August.

Lyngvig. Ø. 2, overtrukket. Smaafugle om Fyret; 1 Islandsk Ryle og 1 Rødstjert faldt.

Gedser Rev. S. Ø. 2, Regn. 1 Stær og 2 Rødkælke ved Fyret.

Tringa canutus. Lyngvig 1.
Ruticilla phoenicura. Lyngvig 1.

23de August.

Stevns. N. Ø. 3, Regntykning. 1 Vendehals faldt.

Gedser Rev. N. V. 2, Regn. 2 Regnspover ved Fyret.

Iynx torquilla. Stevns 1.

(1911.)

26de August.

Lyngvig. V. S. V. 2, overtrukket. 1 Islandsk Ryle faldt.

Stevns. V. S. V. 4. 2 Drosler og 1 Lærke faldt (ikke indsendte.).

Tringa canutus. Lyngvig 1.

27de August.

Læsø Rende. V. 2, Regnbyger. Flere Fugle ved Fyret, nogle faldt i Vandet.

28de August.

Hanstholm. N. Ø. 2, Regn. En Mængde Smaafugle omkring Fyret fra Kl. 11 til Kl. 4.

Rubjerg Knude. N. V. 3, Regn. Mange Smaafugle omkring Fyret: 1 Pomeransfugl, 1 Rødben, 1 Lærke, 3 Havesangere, 9 Løvsangere og 1 Rødstjert faldt.

Hirtshals. S. V. 1 — V. 2. 1 Tornsanger, 1 Havesanger, 8 Løvsangere og 1 Rødstjert faldt.

Skagen. V. S. V. 3, Regn og Dis. Havesangere, Irisker, Stenpikkere, Rødbryste og mange andre Slags Fugle paa Ruderne; omkr. 70 faldt, deriblandt 3 Tornsangere, 2 Havesangere, 26 Løvsangere, 6 Rødstjerte og 16 Brogede Fluesnappere.

Læsø Trindel. V. S. V. 3, Regn. Endel Smaafugle ved Fyret; 2 Løvsangere og 1 Rødstjert faldt.

Eudromias morinellus. Rubjerg Knude 1.
Totanus calidris. Rubjerg Knude 1.
Alauda arvensis. Rubjerg Knude 1
Sylvia cinerea. Hirtshals 1, Skagen 2 (3 faldt.).
Sylvia hortensis. Rubjerg Knude 3, Hirtshals 1, Skagen 2.
Phyllopseustes trochilus. Rubjerg Knude 9, Hirtshals 8, Skagen 4 (26 faldt.), Læsø Trindel 2.
Ruticilla phoenicura. Rubjerg Knude 1, Hirtshals 1, Skagen 6, Læsø Trindel 1.
Muscicapa atricapilla. Skagen 4 (16 faldt.).

29de August.

Vyl. S. V. 3, Regnbyger. En stor Flok Strandfugle kom om Natten flyvende fra Ø. mod Fyret; Flokken vendte straks og fløj indad igen; 1 Selning faldt.

(1911.)

Lyngvig. S. V. 2, Regn. Endel Hjejler og andre Smaafugle om Fyret; 1 Islandsk Ryle, 1 Lærke og 1 Høgesanger faldt.

Lodbjerg. S. 2, overtrukket, Regn og Dis. Nogle Fluesnappere og Stenpikkere ved Ruderne efter Midnat.

Læsø Rende. V. 2, byget. 1 Strandryle faldt (ikke indsendt.).

Tringa canutus. Lyngvig 1.
Calidris arenaria. Vyl 1.
Alauda arvensis. Lyngvig 1.
Sylvia nisoria. Lyngvig 1.

31te August.

Lyngvig. N. V. 5, skyet. En Krikand faldt.

Læsø Rende. V. 2, byget. En ubekendt Fugl faldt (ikke indsendt.).

Anas crecca. Lyngvig 1.

1ste September.

Bovbjerg. S. V. 5, Regn. Enkelte Smaafugle om Fyret; 1 Vildand og 1 Sneppe faldt (ikke indsendte.).

Fornæs. S. V. 3, Regn. Enkelte Smaafugle om Fyret; 1 Islandsk Ryle faldt.

Tringa canutus. Fornæs 1.

6te September.

Vyl. N. V. 4, graat. En Engpiber faldt.

Anthus pratensis 1.

11te September.

Vyl. S. V. 2, klart. En Stenpikker opholt sig paa Dækket imorges og fandtes henimod Aften død i en Krog.

Saxicola oenanthe 1.

16de September.

Anholt Knob. N. 6, skyet. En Gærdesmutte faldt.

Troglodytes parvulus 1.

17de September.

Hammeren. V. S. V. 3, klart. Omkring 20 Strandskader saas flyve om Fyret; 1 faldt.

Hæmatopus ostreologus 1.

(1911.)

18de September.

Hammeren. N. V. 5, diset. En Rødkælk saas paa Ruderne.

20de September.

Skagen. S. V. 3, overtrukket. Endel Smaafugle paa Ruderne; 1 Digesmutte faldt (ikke indsendt).

23de September.

Omø. Stille, skyet, Dis. Enkelte Fuglekonger ved Fyrruderne.

Gedser. N. N. Ø. overtrukket, fin Regn. 1 Sangdrossel faldt; der fandtes kun denne ene Fugl.

Turdus musicus. Gedser 1.

24de September.

Graadyb. Ø. Overtrukket, Regn. Endel Smaafugle om Fyret; 1 Stenpikker faldt.

Blaavands Huk. Ø. 2, Regntykning. Mange Smaafugle ved Fyret; 6 Lærker, 2 Drosler, 3 Fuglekonger og 3 Rødkælke faldt (intet indsendt).

Vyl. Ø. 2, Regn. 6 Lærker, 1 Munk, 1 Havesanger, 2 Løvsangere, 2 Sangdrosler, 2 Skovpibere, 10 Stenpikkere, 2 Rødkælke og 1 Broget Fluesnapper faldt.

Horns Rev. S. Overtrukket. Enkelte Smaafugle ved Fyret om Natten.

Lodbjerg. Ø. N. Ø. 2, overtrukket, Dis. Nogle Rødstjerte, Fluesnappere og 1 Fuglekonge ved Ruderne efter Midnat; 1 Løvsanger, 1 Stenpikker, 2 Rødstjerte og 1 Kvæker faldt.

Hanstholm. Ø. N. Ø. 2, graat. Endel Smaafugle omkring Fyret fra Kl. 1 til Daggry; 1 Havesanger, 1 Ringdrossel, 2 Stenpikkere og 2 Rødkælke faldt.

Skagen. Ø. S. Ø. 3, overtrukket. Store Mængder af Rødbryste, Rødstjerter, Kvækere, Havesangere, Irisker og Fuglekonger paa Ruderne; 1 Rødstjert, 1 Kvæker, 1 Havesanger og 1 Sjagger faldt (intet indsendt).

Skagens Rev. S. Ø. 2, overtrukket. Enkelte Smaafugle ved Fyret om Natten; 1 Rødkælk faldt.

(1911.)

Læsø Trindel. Ø. 3, skyet. Enkelte Fugle ved Fyret; 1 Rødkælk faldt.

Anholt Knob. Ø. 4, overtrukket. Fugle ved Fyret hele Natten; 1 Stenpikker og 1 Rørspurv faldt.

Romsø. S. til N. V. med Dis og Regn mellem Kl. 8 Eftm. og Kl. 4 Form. Mange Smaafugle om Fyret; deriblandt Havesanger, Rødkælk og Graa Digesmutte; ingen faldt.

Omø. Ø. 5, klart og diset. Flere Smaafugle ved Fyrruderne.

Alauda arvensis. Vyl 6.
Sylvia atricapilla. Vyl 1.
Sylvia hortensis. Vyl 1, Hanstholm 1.
Phyllopseustes trochilus. Vyl 2, Lodbjerg 1.
Anthus arboreus. Vyl 2.
Turdus musicus. Vyl 2.
Turdus torquatus. Hanstholm 1.
Saxicola oenanthe. Graadyb 1, Vyl 10, Lodbjerg 1, Hanstholm 2, Anholt Knob 1.
Ruticilla phoenicura. Lodbjerg 2.
Erithacus rubecula. Vyl 2, Hanstholm 2, Læsø Trindel 1.
Muscicapa atricapilla. Vyl 1.
Fringilla montifringilla. Lodbjerg 1.
Emberiza schoeniclus. Anholt Knob 1.

25de September.

Graadyb. V. Overtrukket. Enkelte Fugle om Fyret; 1 Løvsanger og 1 Fuglekonge faldt.

Blaavands Huk. Stille, Smaaregn og diset. Mange Smaafugle ved Fyret; 8 Drosler og 1 Regnspove faldt (intet indsendt.).

Vyl. Stille, klart. Viber og flere andre Fugle om Fyret; 5 Kramsfugle faldt (ikke indsendte.).

Bovbjerg. S. S. V. til N. V. 2, Taage. Endel Lærker, Finker og Kramsfugle om Fyret, enkelte faldt (ingen indsendt.).

Lodbjerg. Ø. N. Ø. senere N. V. 2, overtrukket, Taage. 1 Ringdrossel, 1 Vindrossel og forskellige Smaafugle ved Ruderne om Natten; 1 Strandhjejle og 1 Sangdrossel faldt.

Læsø Rende. S. S. Ø. Skyet. Enkelte Fugle ved Fyret, 1 Sangdrossel og 1 Stenpikker faldt.

Østre Flak. S. S. Ø. 1, overtrukket, Regn. Flere Fugle ved Fyret; 1 Sangdrossel, 1 Stenpikker og 1 Rødstjert faldt.

(1911.)

Anholt Knob. S. Ø. 2, overtrukket. Fugle omkring Fyret; 1 Havesanger faldt.

Schultz's Grund. 1 Stær, 1 Stenpikker, 1 Rødstjert og 2 Rødkælke faldt.

Sejrø. S. Ø. Regndis. Endel Smaafugle samt store Flokke af Viber omkring Fyret.

Kjels Nor. V. S. V. 2, Regndis. 1 Horsegøg, 3 Havesangere, 2 Munke, 1 Træpiber, 1 Sangdrossel, 2 Stenpikkere, 2 Rødstjerte, 9 Rødkælke og 1 Broget Fluesnapper faldt; mange flere faldt, men toges af omstrejfende Katte.

Gedser. V. N. V. Tykning og Regn. En Mængde smaa Fugle om Fyret. 1 Havesanger og 1 Sivsanger faldt.

Gedser Rev. V. N. V. 3, Regn, Taage. Omkring 20 Fugle om Fyret; 1 Munk, 1 Løvsanger, 1 Stenpikker, 1 Rødstjert og 5 Rødkælke faldt.

Hyllekrog. Stille, flovt. Overtrukket og Tykning. Mange Smaafugle flagrede paa Ruderne og i Fyrets Straaler; ingen faldt.

Charadrius squatarola. Lodbjerg 1.
Gallinago scolopacina. Kjels Nor 1.
Sturnus vulgaris. Schultz's Grund 1.
Sylvia hortensis. Anholt Knob 1, Kjels Nor 3, Gedser 1.
Sylvia atricapilla. Kjels Nor 2, Gedser Rev 1.
Acrocephalus phragmitis. Gedser 1.
Phyllopseustes trochilus. Graadyb 1, Gedser Rev 1.
Regulus cristatus. Graadyb 1.
Anthus arboreus. Kjels Nor 1.
Turdus musicus. Lodbjerg 1, Læsø Rende 1, Østre Flak 1, Kjels Nor 1.
Saxicola oenanthe. Læsø Rende 1, Østre Flak 1, Schultz's Grund 1, Kjels Nor 2, Gedser Rev 1.
Ruticilla phoenicura. Østre Flak 1, Schultz's Grund 1, Kjels Nor 2, Gedser Rev 1.
Erithacus rubecula. Schultz's Grund 2, Kjels Nor 9, Gedser Rev 5.
Muscicapa atricapilla. Kjels Nor 1.

26de September.

Læsø Rende. V. Skyet. 1 Rødkælk faldt.

Østre Flak. S. S. V. 3, skyet. Flere Fugle ved Fyret; 1 Stenpikker, 1 Rødkælk og 1 Blaakælk faldt.

Anholt Knob. V. S. V. 3, skyet. 1 Rødkælk faldt og fangedes af Hunden.

Saxicola oenanthe. Østre Flak 1.
Erithacus rubecula. Læsø Rende 1, Østre Flak 1, Anholt Knob 1.
Cyanecula suecica. Østre Flak 1.

27de September.

Skagen. S.V. 4, overtrukket. 1 Rødstjert og 1 Havesanger paa Ruderne.

Læsø Trindel. S. V. 3, skyet. Enkelte Fugle ved Fyret, 1 Rødstjert faldt.

Ruticilla phoenicura. Læsø Trindel 1

28de September.

Lodbjerg. V. N. V. 5, Regntykning. Mange Viber kredsede om Fyret efter Midnat.

Skagen. S. V. 4, Regn. 2 Dobbelte Bakkasiner og 1 Digesmutte faldt.

Hammeren. S. V. 3, diset. Endel Smaafugle paa Ruderne; 10 Kongefugle, 3 Rødkælke og 1 Stær saas.

29de September.

Hesselø. Ø. S. Ø. 3, diset. 35 Vindrosler og endel Lærker faldt (intet indsendt).

30te September.

Anholt Knob. V. N. V. 3, skyet. 1 Rødkælk faldt.

Hammeren. S. Ø. 3, klart. Endel Smaafugle paa Ruderne. 2 Kærsangere, 2 Nattergale og 1 Drossel saas; 1 Kærsanger faldt (ikke indsendt.).

Erithacus rubecula. Anholt Knob 1.

1ste Oktober.

Graadyb. Ø. N. Ø. Overtrukket, Regn. Enkelte Fugle om Fyret; 1 Sangdrossel faldt.

Østre Flak. N. Ø. 4, overtrukket. 1 Lærke faldt.

Anholt. Ø. 3, overtrukket. Mange Smaafugle ved Ruderne; 3 Lærker, 1 Gransanger, 1 Stenpikker, 2 Rødkælke, 4 Kvækere og 7 Rørspurve faldt.

(1911.)

Schultz's Grund. 2 Lærker, 13 Sangdrosler og 6 Rødkælke faldt.

Hjelm. Ø. S. Ø. 3, Regn. Mange Fugle ved Ruderne; 11 Lærker faldt (ikke indsendte.).

Sejrø. Ø. S. Ø. Regndiset. Flere Hundrede Fugle omkring Fyret; 12 Lærker, 10 Rødkælke og omtr. 100 Vindrosler faldt (intet insendt.).

Gedser Rev. Ø. S. Ø. 5, Regn. 1 Ringdrossel og 6 Sangdrosler faldt.

Alauda arvensis. Østre Flak 1, Anholt 3, Schultz's Grund 2.
Phyllopseustes rufus. Anholt 1.
Turdus musicus. Graadyb 1, Schultz's Grund 13, Gedser Rev 6.
Turdus torquatus. Gedser Rev 1.
Saxicola oenanthe. Anholt 1.
Erithacus rubecula. Anholt 2, Schultz's Grund 6.
Fringilla montifringilla. Anholt 4.
Emberiza schoeniclus. Anholt 7.

2den Oktober.

Anholt Knob. N. Ø. 7, Regn. 1 Drossel faldt.

Anholt. Ø. 7, Regn. 1 Hjejle, 3 Ringduer, og 56 Sangdrosler faldt.

Charadrius pluvialis. Anholt Knob 1.
Columba palumbus. Anholt 1 (3 faldt).
Turdus musicus. Anholt 3 (56 faldt.).

3dje Oktober.

Vyl. N. 3, klart. Mange Smaafugle ved Fyret; 1 Ringdrossel faldt.

Rubjerg Knude. S. Ø. 3, Regn. Flere Smaafugle om Fyret; 1 Drossel faldt (ikke indsendt.).

Turdus torquatus. Vyl 1.

4de Oktober.

Horns Rev. N. V. Regnbyger. Enkelte Fugle ved Fyret om Natten.

Hanstholm. Ø. S. Ø. 2, graat, Regnbyger. Enkelte Ringdrosler og Vindrosler om Fyret.

6te Oktober.

Graadyb. Ø. klart. 1 Stær faldt.

Sturnus vulgaris 1.

(1911.)

7de Oktober.

Vyl. Ø. S. Ø. 3, skyet. Endel Fugle om Fyret; 1 Lærke og 1 Solsort faldt.

Alauda arvensis 1.
Turdus merula 1.

8de Oktober.

Lyngvig. N. Ø. 3, Regn. Endel Drosler og andre Smaafugle om Fyret; 2 faldt.

Lodbjerg. N. Ø. 2, overtrukket, Dis. 1 Stenpikker ved Ruderne efter Midnat.

Fringilla montifringilla. Lyngvig 1.

9de Oktober.

Vyl. N. N. Ø. 3, skyet. Flere Smaafugle ved Fyret; 1 Engpiber og 1 Bogfinke faldt.

Anthus pratensis 1.
Fringilla coelebs 1.

10de Oktober.

Skagen. V. N. V. 2, skyet. En Kongefugl paa Ruderne.

Anholt Knob. N. V. 3, overtrukket. Forskellige Fugle opholdt sig paa Skibet; 1 faldt.

Regulus cristatus. Anholt Knob 1.

11te Oktober.

Vyl. N. N. V. 3, skyet. Enkelte Smaafugle ved Fyret; 1 Rødkælk faldt.

Anholt Knob. N. V. 5, skyet. 1 Skovspurv faldt; flere opholdt sig paa Dækket hele Dagen.

Erithacus rubecula. Vyl 1.
Passer montanus. Anholt Knob 1.

14de Oktober.

Vyl. N. N. Ø. 2, tætskyet. 1 Bogfinke faldt.

Hammeren. N. N. V. 2, overtrukket. Omkring 30 Kongefugle saas paa Ruderne.

Fringilla coelebs. Vyl 1.

(1911.)

15de Oktober.

Graadyb. Ø. klart. 1 Stær, 1 Vindrossel og 1 Irisk faldt.

Sejrø. Ø. S. Ø. Af og til overtrukket. Enkelte Drosler ved Fyret; 3 Vindrosler faldt.

Sprogø. Ø. S. Ø. 4, Regndis. 1 Sangdrossel faldt (ikke indsendt).

Sturnus vulgaris. Graadyb 1.
Turdus iliacus. Graadyb 1.
Cannabina linota. Graadyb 1.

19de Oktober.

Lyngvig. Ø. N. Ø. 2, Taage. Stære og andre Smaafugle om Fyret; 1 Gærdesmutte faldt.

Skagen. Ø. 2, klart. 1 Havesanger paa Ruderne.

Troglodytes parvulus. Lyngvig 1.

20de Oktober.

Vyl. Ø. 2, skyet. Flere Smaafugle ved Fyret om Natten; 2 Drosler faldt, den ene i Vandet og en Sortdrossel paa Dækket, hvor den opholdt sig hele Formiddagen og fløj da mod V.

Læsø Trindel. S. 3, Regnbyger. Endel Fugle om Fyret; 6 Vindrosler, 2 Rødkælke og 2 Kvækere faldt.

Anholt Knob. 2. Taage. 1 Gulspurv faldt.

Romsø. S. V. og Dis mellem Kl. 8 og Kl. 12 Eftm. Mange smaa Fugle om Fyret; ingen faldt.

Turdus iliacus. Læsø Trindel 6.
Erithacus rubecula. Læsø Trindel 2.
Fringilla montifringilla. Læsø Trindel 2.
Emberiza citrinella. Anholt Knob 1.

21de Oktober.

Lodbjerg. S. Ø. 2, overtrukket, Taage. Viber hørtes i Taarnets Nærhed før Midnat. Efter Midnat S. 2. En Drossel kom ved Ruderne.

Hanstholm. S. Ø. 2, Taage. Endel Vindrosler omkring Fyret fra Kl. 11 til Dag.

Skagen. S. Stille og 2, Taage og Regn. Store Mængder af Vindrosler og andre Smaafugle paa Ruderne; 21 Drosler og 2 Kvækere faldt (ikke indsendte).

(1911.)

Gedser Rev. S. V. 2, diset. Omkring 10 Lærker og 1 Rødkælk ved Fyret.

22de Oktober.

Skagen. S. 2 og 4, Taage. Endel Vindrosler, Rødkælke m. fl. paa Ruderne; 3 Drosler og 1 Kvæker faldt (ikke indsendte.).

Gedser Rev. S. Ø. 3, klart. 3 Fuglekonger ved Fyret; 1 faldt paa Dækket (ikke indsendt.).

23de Oktober.

Skagen. N. Ø. 2, Regn og overtrukket. Store Mængder af Rødkælke; enkelte Drosler, Kongefugle og andre Smaafugle paa Ruderne. 4 Drosler og 1 Lærke faldt (ikke indsendte.).

24de Oktober.

Blaavands Huk. V. 4, Regntykning. Mange Smaafugle ved Fyret; 75 Drosler, 1 Solsort og 2 Stære faldt (intet indsendt.).

Vyl. V. 5, Regnbyger. Nogle Smaafugle ved Fyret om Natten; 2 Vindrosler faldt.

Lyngvig. Stille, overtrukket, Regn. 1 Stenpiber, 68 Vindrosler, 1 Rødkælk og 1 Kvæker faldt.

Lodbjerg. N. 2, overtrukket, Dis. Nogle Fuglekonger ved Ruderne om Morgenen.

Skagen. S. Ø. 5, Regn. Endel Vindrosler paa Ruderne; 5 Drosler og 1 Stær faldt (ikke indsendte.).

Læsø Trindel. S. 4, Regn. Fugle om Fyret. 14 faldt.

Anholt Knob. V. N. V. 7, skyet. Enkelte Smaafugle ved Fyret; ingen faldt.

Gedser. V. Af og til Regnbyger. 1 Vindrossel faldt.

Alauda arvensis. Læsø Trindel 1.
Sturnus vulgaris. (Blaavands Huk 2).
Anthus obscurus. Lyngvig 1.
Turdus iliacus. Vyl 1, Lyngvig 1 (68 faldt.), Læsø Trindel 6, Gedser 1.
Turdus musicus. Læsø Trindel 1.
Turdus merula. Læsø Trindel 2.
Erithacus rubecula. Lyngvig 1, Læsø Trindel 3.
Fringilla montifringilla. Lyngvig 1, Læsø Trindel 1.

(1911.)

25de Oktober.

Graadyb. S. Overtrukket, Regn. Enkelte Smaafugle om Fyret.

Blaavands Huk. S. V. 5, Regn. 3 Drosler og 2 Stære faldt (ikke indsendte.).

Vyl. S. V. 3, Regn. Endel Drosler, Stære og Lærker saas ved Fyret om Aftenen; 1 Stær, 1 Vindrossel og 1 Sjagger faldt.

Horns Rev. S. S. V. Regn. Omkr. 100 Smaafugle ved Fyret om Natten; 12 Vindrosler og 1 Sangdrossel faldt.

Bovbjerg. S. Ø.—S. 8, Taage, Regn. En Mængde Kramsfugle og Stære om Fyret hele Natten; i Tusinder trak de mod S. i Nattens Løb.

Lodbjerg. S. 6, overtrukket, Regn og Dis. Mange Drosler og Stære ved Ruderne om Natten; 2 Lærker, 2 Stære, 14 Vindrosler og 1 Sangdrossel faldt.

Hanstholm. S. Ø. 2, Taage og Regn. Endel Vindrosler, Solsorter og enkelte Smaafugle om Fyret fra Kl. 10 til Dag.

Rubjerg Knude. Ø. 4, Regn. Mange Smaafugle om Fyret; 1 Stær, 10 Vindrosler og 1 Solsort faldt.

Læsø Rende. S. 5, Regn. Mange Fugle ved Fyret; mange faldt i Vandet.

Østre Flak. S. S. Ø. 4, overtrukket og Regn. Mange Fugle ved Fyret; 2 Lærker, 1 Fuglekonge, 10 Vindrosler, 5 Sangdrosler, 1 Solsort, 2 Rødkælke og 1 Kvæker faldt; endel faldt i Søen.

Anholt Knob. S. 5, overtrukket, Regn. En Mængde Fugle saas omkring Fyret; 3 Lærker, 1 Stær, 1 Vindrossel og 1 Mistel-drossel faldt.

Anholt. S. S. Ø. 3, overtrukket, Regn. 88 Lærker, 36 Drosler (Vindrosler og Sangdrosler), 1 Kvæker og 2 Rørspurve faldt.

Hesselø. V. S. V. 4, Regn, Dis. 40 Vindrosler, 2 Solsorter og endel Lærker faldt (intet indsendt.).

Schultz's Grund. S. S. V. 3, overtrukket. 7 Lærker, 1 Stær, 21 Vindrosler, 1 Solsort og 1 Snespurv faldt.

Hammeren. S. S. V. 4, diset, overtrukket. Omkr. 20 Kongefugle paa Ruderne.

(1911.)

Gedser Rev. S. S. V. 3, klart. Ingen Fugle ved Fyret; 1 Fuglekonge faldt paa Dækket (ikke indsendt.).

Alauda arvensis. Lodbjerg 2, Østre Flak 2, Anholt Knob 3, Anholt 16 (88 faldt.), Schult'z Grund 4 (7 faldt.).
Sturnus vulgaris. (Blaavands Huk 2.), Vyl 1, Lodbjerg 2, Rubjerg Knude 1, Anholt Knob 1, Schultz's Grund 1.
Regulus cristatus. Østre Flak 1.
Turdus iliacus. Vyl 1, Horns Rev 12, Lodbjerg 14, Rubjerg Knude 10, Østre Flak 10, Anholt Knob 1, Anholt 1 (ca. 18 faldt), Schultz's Grund 5 (21 faldt.).
Turdus musicus. Horns Rev 1, Lodbjerg 1, Østre Flak 5, Anholt 1 (c. 18 faldt.).
Turdus pilaris. Vyl 1.
Turdus viscivorus. Anholt Knob 1.
Turdus merula. Rubjerg Knude 1, Østre Flak 1, (Hesselø 2), Schultz's Grund 1.
Erithacus rubecula. Østre Flak 2.
Fringilla montifringilla. Østre Flak 1, Anholt 1.
Emberiza schoeniclus. Anholt 2.
Emberiza nivalis. Schultz's Grund 1.

26de Oktober.

Lyngvig. N.V. 3, overtr. Enkelte Drosler om Fyret; 1 Vindrossel faldt.

Stevns. S. V. 4, Regntykning. 1 Lærke og 2 Vindrosler faldt.

Alauda arvensis. Stevns 1.
Turdus iliacus. Lyngvig 1, Stevns 2.

27de Oktober.

Graadyb. S. V. Regn og Hagelbyger. Endel Fugle om Fyret; 1 Lærke, 4 Vindrosler, 2 Sangdrosler og 1 Sjagger faldt.

Blaavands Huk. S., S. V. 5, Regn og Torden. 36 Drosler og 1 Stær faldt (intet indsendt.).

Vyl. Ø. S. Ø. 4, Regnbyger. Mange Smaafugle ved Fyret om Natten; 3 Lærker og 26 Drosler faldt; flere faldt i Vandet.

Horns Rev. 3, Regn. Flere Hundrede Smaafugle ved Fyret om Natten; 70 faldt paa Dækket, ligesaamange udenbords; 3 Lærker, 8 Vindrosler og 1 Kvæker indsendtes.

Lyngvig. S. V. 5, Regnbyger. Mange Drosler om Fyret; 1 Lærke, 327 Vindrosler og 1 Kvæker faldt.

(1911.)

Hanstholm. Ø. N. Ø. 5, Regn og Sne. En Sneppe fløj omkring Ruderne Kl. 2.

Anholt Knob. S. 4, overtrukket, Regn. Flere Fugle saas ved Fyret om Natten; 1 Lærke, 1 Rødkælk og 1 Snespurv faldt.

Anholt. Ø. 2, Regn. 2 Lærker, 142 Vindrosler, 3 Kvækere og 1 Snespurv faldt.

Hesselø. S. V. 4, Regndis. 10 Vindrosler og 3 Solsorter faldt (intet indsendt.).

Schultz's Grund. S. V. 3, Regn. 1 Solsort og 1 Rødkælk faldt.

Gedser Rev. S. V. 2, Regn. Enkelte Stære og Solsorter ved Fyret.

Alauda arvensis. Graadyb 1, Vyl 3, Horns Rev 3, Lyngvig 1, Anholt 2, Anholt Knob 1.
Sturnus vulgaris. (Blaavands Huk 1.).
Turdus iliacus. Graadyb 4, Vyl 1, Horns Rev 8, Lyngvig 1 (327 faldt.), Anholt 13 (142 faldt.).
Turdus musicus. Graadyb 2, Vyl 1.
Turdus pilaris. Graadyb 1, Vyl 1.
Turdus merula. Schultz's Grund 1, (Hesselø 3.).
Erithacus rubecula. Anholt Knob 1, Schultz's Grund 1.
Fringilla montifringilla. Horns Rev 1, Lyngvig 1, Anholt 3.
Emberiza nivalis. Anholt 1, Anholt Knob 1.

28de Oktober.

Vyl. N. Ø. 6, Regnbyger. Enkelte Smaafugle ved Fyret; 3 faldt.

Lyngvig. N. Ø. 2, skyet. En Del Lærker og Drosler om Fyret; 10 Lærker, 1 Vindrossel og 1 Snespurv faldt.

Kjels Nor. S. V. 2, Regn. 20 Vindrosler, 2 Sangdrosler og 2 Rødkælke faldt.

Gedser Rev. N. 3, Regnbyger. Enkelte store Kramsfugle ved Fyret.

Alauda arvensis. Lyngvig 1 (10 faldt.).
Turdus iliacus. Vyl 1, Lyngvig 1, Kjels Nor 20.
Turdus musicus. Kjels Nor 2.
Erithacus rubecula. Kjels Nor 2.
Fringilla montifringilla. Vyl 1.
Emberiza nivalis. Vyl 1, Lyngvig 1.

29de Oktober.

Blaavands Huk. N. Ø. 3, klart. 19 Drosler og 7 Lærker faldt (intet indsendt.).

(1911.)

Hesselø. Ø. 4, Regndis. 5 Vindrosler og 2 Stære faldt (intet indsendt.).

Stevns. Ø. N. Ø. 4, overtrukket. Af og til Regnbyger. 11 Lærker, 1 Sangdrossel, 7 Rødkælke og 1 Rørspurv faldt.

Hov. N. N. Ø. 4, skyet og klart. 1 Lærke faldt.

Alauda arvensis. Stevns 11, Hov 1.
Sturnus vulgaris. (Hesselø 2.).
Turdus musicus. Stevns 1.
Erithacus rubecula. Stevns 7.
Emberiza schoeniclus. Stevns 1.

30de Oktober.

Lodbjerg. Ø. S. Ø. 5, overtr. 1 Drossel og 2 Stære ved Ruderne efter Midnat.

1ste November.

Nordre Røn. V. S. V. 7, Regnbyger. 4 Drosler faldt; enkelte Smaafugle om Fyret.

2den November.

Vyl. V. N. V. 2, skyet. Nogle Fugle af og til ved Fyret om Natten; 1 Sjagger faldt.

Lyngvig. S. V. 2, skyet. Enkelte Drosler ved Fyret; 4 Sjaggere faldt.

Gedser Rev. V. 4, diset. Omkr. 10 Stære ved Fyret; 1 faldt paa Dækket (ikke indsendt.).

Sturnus vulgaris. (Gedser Rev 1.).
Turdus pilaris. Vyl 1, Lyngvig 1 (4 faldt.).

10de November.

Skagen. V. S. V. 3, klart. En Stær paa Ruderne.

11te November.

Nordre Røn. S. 4, Regn. Mange Fugle om Fyret.

Læsø Trindel. S. Ø. 3, Regn. Fugle om Fyret; 2 Vindrosler og 5 Solsorter faldt.

Turdus iliacus. Læsø Trindel 2.
Turdus merula. Læsø Trindel 5.

12te November.

Nordre Røn. S. Ø. 7. Enkelte Fugle om Fyret; ingen faldt.

(1911.)

Læsø Trindel. Ø. 9, Regn. Enkelte Fugle om Fyret; ingen faldt.

Østre Flak. S. Ø. 3, skyet. 1 Solsort faldt.

Anholt Knob. Ø. 3, overtrukket. Fugle om Fyret; 1 Sjagger faldt.

Turdus pilaris. Anholt Knob 1.
Turdus merula. Østre Flak 1.

13de November.

Lodbjerg. Ø. S. Ø. 6, overtrukket, Regn, Dis. 2 Viber i Nærheden af Taarnet om Aftenen. Efter Midnat S. Ø. 5. 2 Stære ved Ruderne.

Thunø. S. Ø. 7, Regn. 1 Solsort faldt.

Sejrø. S. S. V., overtrukket, Regn, af og til Taage. Nogle Drosler og Smaafugle omkring Fyret; 3 Vindrosler faldt.
Turdus merula. Thunø 1.

14de November.

Lyngvig. V. S. V. 2, skyet. Drosler og Lærker ved Fyret; 3 Lærker, 1 Sjagger og 1 Solsort faldt.

Lodbjerg. S. S. V. 4, overtrukket, Regn, Dis. 1 Stær ved Ruderne før Midnat.

Skagen. S. V. 4, Regn. Endel Drosler paa Ruderne; 1 Solsort og 3 Vindrosler faldt (ikke indsendte.).

Anholt Knob. S. 3, overtrukket. Fugle omkring Fyret.

Alauda arvensis. Lyngvig 1 (3 faldt.).
Turdus pilaris. Lyngvig 1.
Turdus merula. Lyngvig 1.

15de November.

Hanstholm. S. Ø. 2, Regn. Endel Sjaggere, Vindrosler og Solsorter omkring Fyret fra Kl. 7^{30} til Kl. 8^{30}.

Skagen. S. V. 3, overtrukket og Regn. Endel Drosler paa Ruderne; 1 Verling, 4 Vindrosler og 6 Sangdrosler faldt (ikke indsendte.).

Østre Flak. S. V. 3, overtrukket, Regn. Mange Fugle vare ved Fyret; 1 Sjagger og 1 Snespurv faldt.

Anholt Knob. S. V. 3, overtrukket, Regn. 1 Sjagger faldt.

Turdus pilaris. Østre Flak 1, Anholt Knob 1.
Emberiza nivalis. Østre Flak 1.

(1911.)

16de November.

Skagen. S. V. 4, diset. Enkelte Drosler og andre Fugle paa Ruderne.

17de November.

Skagen. V. S. V. 6, byget. Sangdrosler og flere Smaafugle paa Ruderne; 1 faldt (ikke indsendt.).

18de November.

Nordre Rønner. S. Ø. 2, overtrukket. Enkelte Smaafugle om Fyret.

19de November.

Graadyb. Ø. S. Ø., overtrukket. Enkelte Smaafugle om Fyret; 2 Lærker og 1 Snespurv faldt.

Nordre Rønner. N. Ø. 5, overtr. Endel Drosler og Sjaggere om Fyret.

Østre Flak. Ø. 2, overtrukket. 1 Fuglekonge og 1 Irisk faldt.

Sejrø. S. senere Ø. S. Ø., diset, Regn og Tykning. Enkelte Drosler ved Ruderne; 2 Vindrosler faldt (ikke indsendte.).

Gedser Rev. S. Ø. 3, diset. En enkelt Rødkælk ved Fyret.

Alauda arvensis. Graadyb 2.
Regulus cristatus. Østre Flak 1.
Cannabina linaria. Østre Flak 1.
Emberiza nivalis. Graadyb 1.

20de November.

Horns Rev. S. 3, overtr., Regn. Endel Smaafugle ved Fyret; nogle faldt i Vandet.

Lyngvig. N. Ø. 2, Regn. 1 Stormsvale, 4 Lærker og 7 Drosler faldt.

Lodbjerg. S. 2, overtrukket, Regn, Dis. En Drossel ved Ruderne før Midnat; 2 Rødkælke, 1 Stær og enkelte Drosler ved Ruderne efter Midnat; 2 Horsegøge og 1 Sjagger faldt.

Hanstholm. Ø. N. Ø. 4, Regn. Endel Sjaggere og Solsorter omkring Fyret fra Kl. 8 til Midnat.

Læsø Rende. Ø. 3, Regn. 1 Stær og 7 Sjaggere faldt.

Østre Flak. Ø. N. Ø. 4, overtrukket og Regn. En Mængde Fugle var hele Natten ved Fyret. 45 Kramsfugle, 1 Lærke og 5 Solsorter faldt; mange faldt i Søen.

Anholt Knob. N. N. Ø. 4, Regn. Mange Fugle ved Fyret; flere faldt udenbords; 1 Sjagger og 2 Solsorter faldt.

Anholt. Ø. S. Ø. 2, overtrukket, Regn. 1 Lærke, 1 Stær, 65 Vindrosler, 92 Sjaggere, 28 Solsorter, 1 Gulspurv og 2 Snespurve faldt.

Hesselø. N. N. V. 2, Regn, diset. 3 Skovsnepper, 5 Bekkasiner, 20 Vindrosler, 15 Sjaggere, 10 Solsorter og endel Lærker faldt (intet indsendt.).

Sejrø. Stille, Regn, diset. Store Fugleflokke omkring Fyret hele Natten; 8 Vindrosler faldt (ikke indsendte.).

Nakkehoved. S. S. V. 3, Taage og Regn. 3 Sjaggere faldt.

Procellaria pelagica. Lyngvig 1.
Gallinago scolopacina. Lodbjerg 2.
Scolopax rusticula. (Hesselø 3).
Alauda arvensis. Lyngvig 1, Anholt 1.
Sturnus vulgaris. Læsø Rende 1, Anholt 1.
Turdus iliacus. Lyngvig 1, Østre Flak 1, Anholt 5 (65 faldt.).
Turdus pilaris. Lyngvig 1, Lodbjerg 1, Læsø Rende 7, Østre Flak 1, Anholt Knob 1, Anholt 6 (92 faldt.), Nakkehoved 1 (3 faldt.).
Turdus merula. Østre Flak 1, Anholt Knob 1 (2 faldt.), Anholt 4 (28 faldt.), (Hesselø 10.).
Emberiza citrinella. Anholt 1.
Emberiza nivalis. Anholt 2.

21de November.

Østre Flak. N. N. Ø. 3, Regn og Sne. Flere Fugle ved Fyret; 2 Sjaggere, 4 Solsorter og 1 Stenpikker faldt.

Anholt Knob. N. Ø. 3, Regn. Mange Fugle ved Fyret; 1 Vindrossel faldt, flere faldt udenbords.

Stevns. N. V. 4, Regntykning. 1 Enkelt Bekkasin og 2 Vindrosler faldt.

Limnocryptes gallinula. Stevns 1.
Turdus iliacus. Anholt Knob 1, Stevns 2.
Turdus pilaris. Østre Flak 2.
Turdus merula. Østre Flak 4.
Saxicola oenanthe. Østre Flak 1.

22de November.

Lodbjerg. Stille, overtrukket, Sne og Dis. Nogle Drosler og 3 Solsorter ved Ruderne om Aftenen.

(1911.)

Østre Flak. N. N. Ø. 2, overtrukket. 1 Lærke og 2 Vindrosler faldt.

Anholt Knob. N. N. Ø. 3, overtrukket. Fugle omkring Fyret; 1 Solsort faldt.

Schulz's Grund. 3, Regn og Sne. 2 Lærker, 2 Vindrosler, 6 Sjaggere, 3 Solsorter og 1 Snespurv faldt.

Alauda arvensis. Østre Flak 1, Schultz's Grund 2.
Turdus iliacus. Østre Flak 2, Schultz's Grund 2.
Turdus pilaris. Schultz's Grund 6.
Turdus merula. Anholt Knob 1, Schult's Grund 3.
Emberiza nivalis. Schultz's Grund 1.

23de November.

Østre Flak. N. Ø. 3, overtrukket. 1 Lærke faldt.

Anholt Knob. N. 3, overtrukket. Fugle omkring Fyret.

Alauda arvensis. Østre Flak 1.

25de November.

Lodbjerg. Stille, overtrukket. 1 Stær ved Ruderne efter Midnat.

29de November.

Østre Flak. S. 2, Regn. 1 Lærke og 1 Sjagger faldt.

Drogden. N. V. 2, Taage og Dis. 1 Bomlærke faldt.

Alauda arvensis. Østre Flak 1.
Turdus pilaris. Østre Flak 1.
Emberiza miliaria. Drogden 1.

30te November.

Drogden. N. N. Ø. 2, Taage og Dis. 1 Bomlærke faldt.

Gedser Rev. N. V. 2, diset. 2 Lærker ved Fyret.

Emberiza miliaria. Drogden 1.

9de December.

Østre Flak. S. 1, overtrukket. Flere Fugle saas ved Fyret i Løbet af Natten; 1 Lærke og 2 Snespurve faldt.

Alauda arvensis 1.
Emberiza nivalis 2.

12te December.

Læsø Rende. S. S. V. 2, overtrukket. 1 Lærke faldt.

Alauda arvensis 1.

(1911.)

17de December.

Gedser. S. Tykning. 1 Vindrossel faldt; der faldt kun denne ene Fugl.

Turdus iliacus 1.

18de December.

Læsø Rende. S. 4. Regn. Enkelte Fugle ved Fyret; 1 Ryle faldt.

Tringa alpina 1.

19de December.

Anholt Knob. S. 5, overtrukket, Regn. 1 Lærke faldt.

Alauda arvensis. 1.

20de December.

Anholt Knob. 2, Taage. Enkelte Lærker ved Fyret; en lille Fugl fandtes senere paa Dækket død (ikke modtaget.).

24de December.

Læsø Rende. S. 4, overtrukket. 1 Ryle faldt (ikke indsendt.).

30te December.

Sejrø. N. Overtrukket. 1 Stor Stormsvale fangedes ved Ruderne i forkommen Tilstand.

Procellaria leucorrhoa 1.

Forskellige Iagttagelser fra Fyrene.

Graadyb Fyrskib. Februar: *28de* S. S. V. 5, Regntykning. Flere Lærker, flyvende i forskellige Retninger, iagttoges. Marts: *1ste* S. V. 4. Regn. Træk af Ænder mod N. Ø. *5te* V. N. V. 3. Regnbyger. Træk af Ænder mod N. Ø. *6te* N. V. 3. Klart. Træk af Viber. *10de* V. 3. Klart. Træk af Viber mod N. Ø. *14de* Ø. 3. Regnbyger. Træk af Ænder mod N. Ø. *28de* Ø. 3. Overtrukket. Træk af Viber mod Ø. — April: *14de* V. S. V. 3. Diset. Træk af Svaner mod N. — Oktober: *3dje* N. Ø. Klart. En Flok Svaner fløj mod S. *4de* S. Klart. En Flok Vildgæs fløj mod S. *6te* Ø. Klart. Flere Træk af Smaafugle mod S. *9de* N. Ø. Klart.

(1911.)

Træk af Smaafugle mod Ø.; flere Træk af Ænder mod S. *11te* N. V. Klart. Træk af Vildgæs mod S.; Krager omkring Skibet. *15de* Ø. Klart. Træk af Vildgæs mod S.; Smaafugle og Krager omkring Skibet. *16de* Ø. S. Ø. Klart. Træk af Smaafugle mod S.; Træk af Ederfugle og Svaner mod N. V. *19de* Ø. S. Ø. Klart. Træk af Smaafugle mod S. *27de* V. Skyet. 7 Graagæs trak mod S. *28de* N. Ø. Skyet. En Flok Krager fløj mod Ø. — December: *7de* S. S. Ø. Graat. En Gærdesmutte og enkelte Smaafugle fløj om Skibet. *9de* V. S. V. Skyet. En Flok Ænder fløj mod S. — J. S. Ibsen.

Vyl Fyrskib. Januar: *1ste* N. V. 5. Graat. En Del Søpapegøjer saas idag svømme, dykke og flyve rundt om Skibet. Imellem dem saas en meget lille, paa Størrelse med en Stær [Mergulus alle?]. Maagerne, hvoraf en Mængde i denne Tid opholder sig ved Skibet, graadigt slugende alt Affald, gjorde ivrigt Jagt paa den, men den dykkede under hver Gang, de kom den nær. Flere Suler saas. *19de* V. N. V. 3. Graat. Flere Smaafugle, vistnok Lærker, saas i Dagningen flyvende mod S. Ø.

Februar: *7de* N. N. V. 4. Regnbyger. Enkelte Lærker saas om Morgenen. *13de* Ø. S. Ø. 2. Taage. Flere Smaaflokke af Lærker saas idag. *18de* S. V. 4. Graat. Viben hørtes inat. *27de.* En Kramsfugl saas paa Dækket.

Marts: *14de* Ø. N. Ø. 2. Regn. En Snespurv saas paa Dækket idag. *16de.* En Bogfinke og 2 Engpibere opholdt sig paa Dækket. *22de* Ø. 3. Skyet. En Gærdesmutte opholdt sig paa Dækket i Eftermiddag. *28de* Ø. 2. Graat. En Ugle opholdt sig i Rigningen om Eftermiddagen. *29de* Ø. N. Ø. 2. Graat. En Stær opholdt sig paa Dækket. *31te* N. Ø. 2. Klart. Flere Smaafugle opholdt sig idag paa Dækket, derimellem Fuglekonger og Gærdesmutter.

April: *2den* Stille, Taage. Endel Stære, Lærker og Drosler saas ved Skibet.

Maj: *2den* S. 2. Taage og Dis. Endel Drosler og Stære flyve om Skibet. *10de* Ø. N. Ø. 2. Letskyet. En Mængde forskellige smaa Sangfugle flyve rundt paa Dækket, jagende efter Fluer og andre

(1911.)

Insekter, der i det smukke Vejr ere komne ombord i stort Antal. I Skumringen saas en lille Ugle komme flyvende fra Ø. Terner saas idag. *11te* Ø. 2. Halvklart. Endel smaa Sangfugle opholde sig stadig ombord og jage efter Fluer. En Høg saas i Middags at kredse om Skibet. I de sidste Par Dage er en Fugl paa Størrelse med en stor Due hyppigt set kredsende om Skibet; den er lys med sort Hoved, Vinger og Hale; Halen løber ud til to lange Spidser. Af Søfolk kaldes den „Baadsmanden med Merlespigerne" [Lestris sp]. En Skovdue hvilede idag paa Klyverbommen. *13de.* Stille, klart. Endel Smaafugle stadig ombord. *16de* V. 2. Taage. En Spurvehøg kredsede om Skibet imorges. *17de* N. 2. Skyet. Et Par Stære og nogle Smaafugle ved Skibet. En Spurvehøg kredsede om Skibet og satte sig hyppigt til Hvile et Øjeblik. *20de* N. N. Ø. 2. Skyet. Nogle Suler saas idag, jagende efter Maagerne. *25de.* Stille, graat. En Flok Svaler fløj rundt om Skibet idag. *26de* Ø. S. Ø. 2. Skyet. Nogle smaa Sangfugle saas idag jagende efter Fluer paa Dækket. Flere Svaler saas ved Solnedgang. *29de* N. Ø. 2. Klart. To smaa Sangfugle opholdt sig paa Dækket idag, jagende efter Fluer.

Juni: *20de.* Stille, Regn. En Sjagger saas ved Skibet idag. *24de* N. V. 2. Letskyet. En Korsnæb opholdt sig en Tid paa Skibet. *26de* Ø. 2. Klart. En Høg sad ved Solnedgang nogen Tid i Rigningen.

August: *11te.* Stille, klart. To Graa Fluesnappere have igaar og idag opholdt sig paa Skibet og været travlt beskæftiget med at fange Fluer.

September: *16de* Ø. 2. Klart. I Formiddags opholdt en Fuglekonge sig omkring paa Skibet.

Oktober: *7de* Ø. S. Ø. 3. Skyet. En Høg kredsede om Skibet ved Solnedgang; en Ryle og en stor Ugle saas flyve om Skibet. *14de* N. N. Ø. 2. Tætskyet. En Høg, Krager og flere Smaafugle saas idag. *20de* S. 2. Skyet. Nogle Bogfinker og Stære opholdt sig i Eftermiddag omkring paa Dækket. *21de.* Imorges var atter et Par Bogfinker paa Dækket. *24de* V. 5. Regnbyger. I Eftermiddag var 2 gule Vipstjerter paa Dækket; de fløj bort mod S. V. — J. S. Jensen, A. H. Schmidt.

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Horns Rev Fyrskib. Februar: *13de* Skyet. 2 Stære opholdt sig paa Dækket om Dagen. — Maj: *11te.* En lille Fugl opholdt sig paa Dækket hele Dagen, blev Natten over og fandtes død paa Dækket om Morgenen (ikke indsendt.); en Høg kom og satte sig i Rigningen om Aftenen ved Fyrets Hejsning. *12te.* Flere forskellige Smaafugle kom om Morgenen flyvende til Skibet og blev hele Dagen; de fleste af dem fandtes døde om Natten paa Dækket. — Oktober: *4de.* En Høg kom om Aftenen og satte sig paa Mesanbommen, fløj kort efter bort. *6te.* En Stær kom om Formiddagen, satte sig i Rigningen, fløj kort efter bort. *13de.* En Flok Stære (omtr. 10 Stkr.) kredsede flere Gange om Skibet ved Fyrets Hejsning og fløj derefter bort. *14de.* Enkelte Smaafugle sad om Morgenen ved Fyrets Slukning i Rigningen, men fløj kort efter bort. — November: *20de.* En Ravn opholdt sig i 4 Dage paa Skibet; den 5te Dag om Morgenen var den borte og antoges det, at den var falden i Vandet om Natten. — H. Sonnichsen, C. E. Søjborg.

Bovbjerg. Januar: *12te.* Aarlig plejer Masser af Fugle at vise sig ved Fyret, men iaar er ingen set siden sidst i November. — Februar: *26de.* Ingen Fugle set siden 12te Januar. — Maj: *8de* S. Ø. 2. Dis. Flere store Flokke Graagæs trak mod N.; der var i hundredevis i hver Flok. — C. Rude.

Thyborøn. Februar: *2den* N. V. Skyet. En Rødben paa Fjordstranden. — April: *14de* V. Diset. En stor Flok Krager trak mod N. Ø., efter at have opholdt sig paa Fjordstranden en Tid. *18de* S. Ø. Skyet. En Mængde Krager trak mod N. — Maj: *6te* N. V. Klart. En Flok Ænder trak ind over Kanalen. *9de* N. Ø. Skyet. Endel Krager trak mod N. Ø. — September: *6te* V. N. V. Skyet. Vildgæs trække fra N. langs Kysten. *8de* S. V. Diset. Vildgæs trække fra N. langs Kysten. *9de* N. V. Skyet. 6 Flokke Vildgæs trak ind i Fjorden. *14de* N. V. Byger. Store Flokke Vildgæs trak fra N. *15de* N. V. Store Flokke Vildgæs kom atter idag trækkende fra N. — Oktober: *1ste* N. N. Ø. Skyet. 5 Krager trak mod S. *3dje* N. N. Ø. Byger. Store Flokke Vildgæs trak

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mod S. *4de* S. Byger. 3 Graagæs trak mod S. *6te* Ø. N. Ø. Diset. En stor Flok Graagæs trak mod S. *19de* S. Ø. Diset. En stor Flok Krager trak mod S. V. — J. Nielsen.

Lodbjerg. Februar: *2den.* Nogle Stillidser i Fyrets Plantage om Dagen. *24de.* Drosler og Solsorter i Haven om Dagen. — Marts; *11te.* Rødkælken set om Dagen. — April: *24de.* Lys Fluesnapper set om Dagen. — Maj: *10de.* Svalen set om Dagen. *14de.* Gøgen hørt om Dagen. — Oktober: *22de* S. Ø. 4. Overtrukket, Regn, Dis. En Drossel set i Haven om Dagen. — P. S. Pedersen.

Højen. Intet Fuglefald. — A. T. Friis.

Skagen. Maj: *12te* Ø. 3. Skyet. Hørtes Gøgen første Gang. — Oktober: *16de* S. 2. Klart. 3 Gæs fløj mod S. — November: *9de* S. V. 4. Skyet. En stor Flok Gæs fløj mod S. V. — G. H. E. Wielandt.

Skagens Rev Fyrskib. Januar har der været de sædvanlige Maager og Alke, men ellers intet særligt Træk af Fugle. — Februar: *2den* V. 4. Skyet. 2 Lærker vare ved Skibet. *10de.* Laber, løbende Vind, skyet. 1 Lærke var her ved Skibet om Dagen. *24de.* Vind 4. Bygevejr. 2 Lærker vare ved Skibet. *25de.* Vind 4. Skyet og Byger. Flere mindre Flokke Lærker fløj forbi Skibet om Dagen. *26de* S. 3. Skyet. Atter i Dag fløj flere mindre Flokke Lærker forbi Skibet. — Marts: *1ste* N. Ø. 2. Klart. 2 Krager fløj mod Øst; endel Lærker var her i Løbet af Dagen. Fra *5te* til *10de* saas enkelte Krager og Lærker ved Skibet. *12te* S. 4. Byget. En enkelt Vibe fløj mod V. *13de* S. 2. Overtrukket, Byger. I Løbet af Dagen vare enkelte Stære ved Skibet. *20de.* Stille, klart. Flere Flokke Lærker og Krager trak forbi Skibet i Løbet af Dagen. *24de* N. Ø. 3. Skyet. En Mængde Krager fløj i Ø.; enkelte Lærker og Stære vare ved Skibet. *24de* til *31te* fløj daglig Lærker, Krager og enkelte Stære forbi Skibet. — April: *16de* og *17de* V. 9. Klart. Flere Flokke Ænder fløj mod Ø. — Maj: *2den* S. V. 2. Overtrukket. Flere Flokke af Ænder og Gæs. *13de* S. Ø. 2. Overtrukket. Flere Smaafugle ved Skibet. *31te* N. N. Ø. 2.

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Klart. I Løbet af Dagen fløj en Masse Svaler i østlig Retning. — Oktober: Iagttoges Flokke af Ænder, ellers kun de sædvanlige Maager. — November: *11te* S. 2. Overtrukket. Enkelte Flokke af Krager fløj i vestlig Retning. *14de* S. S. V. 3. Overtrukket. Flere Flokke af Ederfugle og Ænder fløj i alle Retninger. — December: Maager og Alke saas, ellers iagttoges ingen andre Fugle. — T. A. R. Due.

Nordre Rønner. Januar: Intet Fuglefald. *17de.* Stæren set. *26de.* 4 Svaner fløj i N. V. — Februar: *1ste.* 2 Svaner fløj i S. V. *6te.* Præstekraven set første Gang. *16de.* 2 Svaner fløj i N. Ø.; de første Gravænder saas. *23de* kom flere Gravænder, som toge Ophold her for Sommeren. — Marts: Intet Fuglefald. Af andre Fuglearter har her været ligesom de foregaaende Aar og noget forøget i Tal. — L. F. Madsen.

Læsø Trindel Fyrskib. Januar: *27de* N. V. 2. Overtrukket. 6 Svaner og omkr. 20 Gæs trak N. *29de* N. Ø. 2. Klart. 18 Svaner trak N. — Februar: *12te* Ø. 2. Skyet. En Stær opholdt sig paa Dækket. *20de* V. 2. Skyet. 14 Svaner trak N. Ø. *25de* S. 2. Skyet. En Flok Viber fløj forbi. — Marts: *8de* S. Ø. 2. Skyet. Flere Flokke Krager mod N. Ø. *11te* S. V. 6. Regn. En Flok Viber mod S. V. — April: *1ste* Ø. S. Ø. 2. Skyet. Flere Flokke Krager fløj mod N. Ø. *16de* V. 6. Regnbyger. En Flok Krager fløj mod N. Ø. *17de* N. V. 5. Skyet. Atter idag fløj en Flok Krager mod N. Ø. — Juli: *24de* V. 3. Skyet. 12 Viber fløj mod S. Ø. *30te* S. Ø. 3. Klart. En Due opholdt sig ombord nogle Timer om Formiddagen; en Falkehøg kredsede nogle Gange om Skibet og fløj da mod S. V. — September: *2den* V. S. V. 3. Skyet. Nogle Lærker og Vipstjerter mod S. V. *23de* Stille og Smaabyger. 2 Svaler ombord midt paa Dagen. — Oktober: *8de* N. 3. Skyet. En Bogfinke ombord midt paa Dagen. *12te* V. N. V. 3. Skyet. Flere Flokke Krager fløj mod S. V. *14de* Ø. 2. Skyet. En Flok Graaspurve ombord; mange Krager fløj mod S. V. — November: *1ste* V. 7. Regnbyger. Mange Flokke Ederfugle i alle Retninger. *4de* V. S. V. 7. Tre Suler fløj mod Vest. *25de* Ø. N. Ø.

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4. Skyet. Flere Flokke Svaner fløj mod V. — December: *1ste* S. Ø. 3. Overtrukket. En Flok Svaner paa 15 Stkr. fløj mod V. — F. Winther.

Læsø Rende Fyrskib. Februar: *25de.* En Maage [Larus tridactylus.], forfulgt af andre søgte Tilflugt ved Skibet og fangedes; Bugen var oprevet. *26de.* 10 Svaner fløj fra V. mod Ø.; 6 Viber fløj fra V. mod Ø. — Oktober: *7de* S. 3. Skyet. Flere Flokke Krager fløj mod V. *8de* N. Ø. 3. Regn. Flere Flokke Krager fløj mod V.; en Bogfinke opholdt sig paa Skibet. — P. C. Grumsen.

Egense. Januar: *13de* S. S. V. Skyet. I Farvandet iagttoges torskellige Flokke Ænder og Ederfugle. — Februar: *5te* N. V. 2. Klart. Flere Stære saas i Stationens Have og Lærker hørtes. *12te* Ø. Skyet. Blaakrager saas paa Landgrunden. *19de* Vind 1. Skyet. Stæren saas i store Flokke og 2 Viber saas. — Marts: *9de* S. Ø. 1. To store, sortvingede Maager saas paa Grunden. — April: *9de* N. Ø. Skyet. Store Flokke af Gæs paa Kanten af Landgrunden. *10de* Vind 6. Skyet. Gæs og Maager i Flok paa Landgrunden. *22de* S. V. Overtrukket. Store Flokke Gæs opholdt sig paa Landgrunden. — Maj: *4de* S. V. Den første Svale saas paa Stationen. *7de.* Stille, klart. 4 Svaler saas; de første Maageæg fandtes paa Holmen; Storken saas i Hals. — Juni: *30te* S. V. 2. Skyet. En Strandsneppe saas paa Strandbredden. — Oktober: *3dje.* Stille. Stæren trak mod S. *5te.* Stille. En Flok Svaner trak mod S. — A. C. G. Grove-Stephensen.

Anholt Knob Fyrskib. Februar: *20de* V. 2. Skyet. Enkelte Lærker hørtes synge. *24de* V. S. V. 5. Regn. En Vibe og 2 Lærker fløj mod V. — Marts: *7de.* Stille, skyet. Store Flokke Krager fløj mod Ø. *12te* S. S. V. 3. Taage. Enkelte Smaafugle omkring Skibet. *31te* N. 2. Skyet. Mange Flokke Krager fløj mod Ø.; flere Smaafugle opholdt sig paa Skibet. — April: *18de* S. 3. Regn. Flere Flokke Krager fløj mod Ø. *19de* S. Ø. 2. Diset. Flere Smaafugle paa Dækket hele Dagen. — Maj: *1ste* S. V. 3. Skyet. Flere Smaafugle opholdt sig paa Skibet. *16de* S. Ø. 3. Overtrukket. En Flok Graagæs fløj mod V. — Juni: *9de* N. 5.

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Klart. 2 Stære opholdt sig en kort Tid paa Skibet og fløj da mod S. S. V. — September: *1ste* V. 6. Overtr. En Svale opholdt sig nogle Timer paa Skibet, fløj senere mod V. *7de* V. N. V. 6. Skyet. En Flok Ænder fløj mod S. V. *21de.* S. Ø. 6. Overtrukket. En Flok Ænder fløj mod S. V. — Oktober: *11te* N. V. 5. Skyet. Flere Skovspurve opholdt sig paa Dækket hele Dagen; en fandtes død (indsendt.). *15de* Ø. S. Ø. 6. Skyet. Flere Flokke Krager fløj mod V. *16de* S. Ø. 3. Skyet. Atter idag fløj store Flokke Krager mod V. *28de* N. N. Ø. 4. Skyet. Flere Flokke Krager fløj mod S. V. — November: *4de* V. 8. Skyet. En Flok Ænder fløj fra Ø. mod S. V. — Th. Andresen. Toftgaard Nielsen.

Spodsbjerg. Intet Fuglefald. — P. Christensen.

Fornæs. Februar: *2den* N. V. 3. Overtr. Den første Stær saas. *7de* N. N. Ø. 5. Skyet. 2 Svaner fløj lavt over Havet fra S. til N. — April: *29de* V. 3. Regn. Om Dagen saas mange Rødkælke i Fyrets Have. — Maj: *14de* S. Ø. 2. Klart. 3 Strandskader fløj langs Stranden fra N. til S. Ingen Taage eller usigtbart Vejr i dette Foraar er vel Aarsagen til, at ikke flere Fugle have været omkring Fyret. — Juli: *27de* S. 3. Skyet. Omkr. 50 Knortegæs passerede Fyret fra S. til N. *31te* Ø. S. Ø. 2. 13 Strandskader fløj lige over Fyrbygningen fra N. til S. — August: *24de* V. 3. Skyet. 15 Regnspover passerede Fyret fra S. til N. — September: *16de* N. 2. Klart. 7 Skarve fløj over Fyret fra N. til S. Toplærker, som have været set her ved Fyret hele Aaret rundt i flere Aar, ere ikke iagttagne her i 1911. Intet Fugletræk har været her i Efteraaret. — A. Kruse.

Hjelm. Januar: *1ste.* Set en Stær. Februar: *20de.* Set en Stork. *21de.* Set Viben. — A. Jensen.

Æbeltoft. Intet Fuglefald. — H. P. Mønsted.

Sletterhage. Intet. — V. Larsen.

Sejrø. Oktober: *7de.* Ederfuglene begynde nu at indfinde sig; de opholde sig i Smaaflokke paa Revet udfor Fyret. *15de* Ø. S. Ø. Om Morgenen saas enkelte store Flokke Ederfugle og Dykænder paa Træk. — November: *13de* S. S. V. Store Flokke af

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Dykænder og Ederfugle opholde sig paa Søen udfor Fyret. *19de* S. senere Ø. S. Ø. Smaaflokke af Havlitter saas og hørtes paa Søen i Fyrets Nærhed. — December: *28de.* 4 Svaner saas ude paa Revet N. V. for Fyret. — N. J. Z. Nielsen.

Lappegrundens Fyrskib. Februar: *17de* N. V. 8. To Vildænder fløj mod V. *20de* Ø. 3. En Flok Lærker fløj mod S. Ø. — Marts: *1ste* V. S. V. 2. Skyet. 8 Svaner fløj mod N. *8de.* En Flok Ederfugle fløj mod *Ø. 31te.* Flere Flokke Ederfugle trak i forskellige Retninger. — April: *8de* N. V. 2. Klart. Flere Flokke Ederfugle trak mod S. *18de* S. S. Ø. 2. En Flok Vildgæs fløj mod S. — September: *19de* S. Regnbyger. En Flok Vildgæs fløj mod N. — Oktober: *11te* N. V. En Flok Vildgæs fløj mod V. *12te* N. V. Flere Flokke Ederfugle og Vildænder fløj i forskelllige Retninger. *14de* S. Ø. Flokke af Krager fløj mod S. V. *20de* S. V. En Flok Vildgæs fløj mod V. *28de* N. N. Ø. En Flok Ederfugle fløj mod V. — November: *1ste* V. N. V. En Flok Ederfugle fløj mod S. *8de* S. S. V. En Flok Vildgæs fløj mod V. — December: *17de* S. V. En Flok Vildænder fløj mod S. Ø. *25de* S. V. En Flok Vildænder fløj mod S. — J. C. Jensen, A. Albertsen.

Kronborg. Intet Fuglefald. — H. B. J. Reinwald.

Middelgrunden. Intet. — A. G. Saxtorph.

Trekroner. Intet Fuglefald. — H. E. Andresen.

Nordre Røse. Her ved Fyret er i Aarets Løb ikke indtruffet noget Fuglefald; de Fugle, som i Reglen trække her, ere Ederfugle og af og til en Flok Gæs, som om Aftenen trækker over mod Saltholmen. — J. F. Hansen.

Drogden Fyrskib. September: *25de* V. En Rødkælk ved Fyret hele Dagen. — Oktober: *30te* S. Ø. Skyet. En Svane fløj fra V. mod N. Ø. Kl. 8 Form. — November: *19de* Ø. S. Ø. 5 Svaner i Flok fra S. V. mod N. Ø. *30te.* Lærker i Flok ved Skibet Kl. 9 Form. — December: *1ste* Ø. N. Ø. 12 Svaner fløj fra N. Ø. mod S. V. Kl. 10 Form. *8de* S. S. Ø. Dis. 5 Lærker kredsede om Skibet Kl. 9 Form. — N. J. Kromann.

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Refsnæs. Hele Vinteren store Flokke af Ederfugle, Havlitter, Sortænder og enkelte Torskeænder [efter indsendt Prøve Fløjlsænder (*Oedemia fusca*)] paa Revet. — Marts: *30te* begyndte de første Ederfugle at trække mod N. — April: *26de* saas Storken første Gang. — Maj: *2den* saas Svalen første Gang; 3 Par Gravænder ankom til Rugeplads i Fyrets Nærhed. *9de* hørtes Gøgen første Gang. — I Oktober og November saas flere Nøddekriger i Fyrets Nærhed, undertiden Flokke paa omtr. 20 Stkr. Ederfugle. Havlitter og Fløjlsænder have hele Efteraaret opholdt sig paa Revet. — C. F. V. Jensen.

Romsø. Maagerne begyndte d. 15de Juli at trække væk fra Øen med Yngelen. — H. Würtz.

Halskov. Intet Fuglefald. — C. P. Henningsen.

Sprogø. Februar: *3dje.* 4 Svaner fløj fra S. til N. *4de* saas Stæren første Gang. — Marts: *17de.* Stort Kragetræk fra Fyn til Sjælland. *23de* ankom de første Maager, en Snes Par, til Rugepladsen. — April: *16de* saas de første Maageredededannelser. *18de* kvækkede Strandtudse og Grønbroget Tudse første Gang iaar. *19de* saas den første Svale. *24de* saas de første Hættemaageæg. *27de* saas de første Strandmaageæg. — Maj: *9de* saas en stor Flok (et Par Tusind) Ederfugle trække mod N. i Bæltet; der har været usædvanlig mange Ederfugle tilstede i Løbet af Forsommeren. — Juni: *16de* saas de første Strandmaageunger. — August: *9de* havde Maagerne forladt Øen. *26de* kom flere store Flokke Stære til Øen, efter at de havde været borte nogen Tid. — Oktober: *8de.* Kragetræk fra Sjælland til Fyn. *9de* saas den første store Flok nyankomne Ederfugle paa Revene; Ederfuglene synes at være talrigere og at være tidligere i Aar, end de pleje; sidst paa Aaret, og efter at være jagede endel, var dog en stor Del af dem atter trukket bort. Fugletrækket forbi Sprogø har i 1911 været yderst sparsomt. — A. V. Hansen.

Slipshavn. Intet Fuglefald. — E. Jørgensen.

Helholm. Januar: *22de* Gravgaasen set. — Februar: *19de.* Viben og Strandskaden sete. I Aaret 1911 intet Fuglefald.

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Af Fugle, som ruge her, kan nævnes Strandskaden, Strandmaagen, den Sorthovede Maage, Gravanden, Graaanden og den Spidsnæbede And. — P. Larsen.

Omø. Juli: *24de.* Om Natten faldt en Brevdue ved Fyret; den var mærket med en Ring om højre Ben med Indskrift D. 11 —110. Stille og skyet. — September: *10de* store Flokke Viber fløj om Eftermiddagen over Øen mod S. — Oktober: *27de* S. V. Stormende, skyet og diset. En Mængde (omtr. 200 Stkr.) Ederfugle opholde sig ved Fyret; de kom i Løbet af Natten. — November: *14de,* diset. Kl. 8 Aften stod jeg ude paa Omgangen i Anledning af, at Orlogsskibe affyrede flere Kanonskud, hvorved en større Flok Ederfugle blev opskræmt; i deres Forskrækkelse fløj de lige mod Fyret, som de først opdagede i sidste Øjeblik. Jeg saa dem i Flugten rejse sig lige paa Halen med Fødderne udstrakt som for at værge for sig og Vingerne udspilede. Fuglene tumlede ned paa begge Sider af Taarnet; jeg hørte dem straks efter kravle i Vandet. En Fugl klarede sig ikke; Farten, den havde paa, var for stærk, saaledes at den kom ind mellem Gelænderet og Taarnet og forslog sig endel; jeg var straks efter nede og undersøge Stranden, men de andre vare da komne i Vandet. — P. F. Köhler.

Vejrø. Intet Fuglefald i sidste Halvaar. — C. A. Hansen.

Taars. Intet Fuglefald. — W. Pedersen.

Æbelø. I Efteraaret har der ikke været en eneste Fugl paa Ruderne. — E. Schønfeldt.

Strib. Intet Fuglefald. — Februar: *17de* Stæren set. — Marts: *31te.* Stille; Mange Flokke Graagæs fløj mod N. — August: *10de.* Stille og klart. Mange og store Flokke Himmelhunde trak mod S. — September: *20de* S. S. V. 2. Overtr. Mange og store Flokke Graagæs trak mod S. — Enkelte forskellige Ænder have opholdt sig i Bæltet hele Aaret. — A. H. Andersen.

Baagø. Intet Fuglefald eller Fugletræk iagttaget. — N. Hansen.

Assens. Intet Fugletræk eller Fuglefald iagttaget i Aarets Løb. — N. Lund.

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Hammeren. Oktober: Daglig ses Vildgæs trække mod V. i smaa Flokke. *26de* V. S. V. 8. Diset. Omkr. 20 Svaner fløj mod V. — A. M. Dam.

Dueodde Sydfyr. April: *9de* N. V. 2. En Flok Svaner paa omtrent 50 Stykker saas paa Søen S. V. for Fyret i en Afstand af c. 2000 Alen fra Kysten. — Oktober: *13de* N. V. 1. En Flok Graagæs trak mod S. V. ud over Søen Kl. 4 Eftm. *14de* Ø. 3. Klart. En Flok Graagæs paa 23 Stykker trak mod Ø. om Eftermiddagen Kl. 5. *16de* Ø. 3. Klart. 8 Graagæs trak mod S. V. — November: *16de* S. V. 3. Kl. 11 Form. saas 21 hvide Svaner i Flok trækkende langs Kysten mod Vest; Kl. 11^{45} saas 19 Svaner i Flok atter trækkende langs Kysten mod Vest. — Ud over ovenstaaende har intet været iagttaget. Intet Fuglefald af nogen Slags har fundet Sted i 1911. — H. S. L. Madsen.

Møen. Ingen Fugle ere faldne i Aaret 1911, dog kun at regne fra 5te April, da jeg tiltraadte Tjenesten her. — H. P. Jensen.

Harbølle. Intet Fuglefald. — A. J. Olsen.

Gedser. Oktober: *16de* Kl. 10^{45} trak en Flok Vildgæs fra N. V. og fortsatte i S. S. Ø. ud over Søen. — Fuglefaldet i dette Efteraar har her ved Fyret været meget ringe, hvilket antages at skyldes den Omstændighed, at vi kun have haft ringe Tykning i Træktiden. — Chr. Lindgaard.

Gedser Rev. Januar: *20de* V. 3. 6 Svaner fløj fra N. V. mod S. Ø. — Februar: *7de* V. S. V. 3. Tre Svaner fløj fra N. V. mod S. Ø. *11te* S. Ø. 2. 17 Svaner fløj fra S. Ø. mod N. V. — Marts: *8de* V. 2. Omkring 50 Graagæs fløj fra N. V. mod S. Ø. *31te* V. S. V. 2. Diset. 30 Graagæs trak fra N. V. mod S. Ø. — August: *28de* S. V. 2. Tre Fluesnappere opholdt sig ved Skibet Dagen igennem. *29de* V. 3. Skyet. 100 Storke fløj mod S. S. Ø. Kl. 4 Eftерm. — J. Jensen.

Hyllekrog. Februar: *25de* Stille, klart. Flokke af Lærker kom fra S. — J. N. B. Höeg.

(1911.)

Meddelelser om mindre almindelige danske Fugle.

Colymbus arcticus.

En Sortstrubet Lom, Han, blev skudt ved Oddesund i Limfjorden 1ste Januar 1912 og indsendt som Gave til Museet af Fisker Peter Outzen.

Procellaria pelagica.

To Stormsvaler fandtes ifølge Meddelelse fra Lærer Chr. Christiansen 6te November 1911 døde paa Jelling Mark og Toftby Mark, Gadbjerg Sogn (c. 15 Kilm. N. V. for Vejle), sandsynligvis forslaaede og dræbte i den foregaaende Stormnat; de fandtes en Afstand af c. 250 m. fra hinanden.

Phalaropus hyperboreus.

En Odinshane, ung Hun, blev skudt paa Taarnby Fælled, Amager, 31te August 1912; Skindet erhvervedes af Zoologisk Museum.

Alca torda.

En Alk, ung Hun, i Sommerdragt men hvidfødt med alle de ellers rensorte Fjer hvidbrune, skudt 10de Maj 1911 i Lille Belt, modtog Museet fra Lottericollecteur J. Petersen i Assens.

Lestris longicauda.

En Lille Kjove, ung Han, blev skudt i Kalvebodstrand 12te September 1911; Skindet, der var usædvanlig lyst farvet, erhvervedes af Museet.

Sula alba.

En udfarvet Sule fandtes mellem Jul og Nyaar 1910 døende paa Vandet nær Middelgrunden, meddeler Fyrmester H. Würtz.

Aquila nævia.

En Skrigørn, gammel Hun, blev, efter Meddelelse af Conservator H. P. Hansen i Herning, skudt 7de Juli 1912 i Højsvig, Sønder Felding ved Troldhede, hvor den havde opholdt sig omtrent

(1911.)

14 Dage i et Egekrat med Eng ved den ene Side. Skindet og Skelettet erhvervedes af Zoologisk Museum.

Circus cineraceus.

En Enghøg, udvokset Han, blev skudt ved Sevel, Vinderup, N. Ø. for Holstebro 1ste Aug. 1912. I Maven var Rester af 1 Mus og 2 Lærker. Skindet modtog Museet fra Conservator H. P. Hansen, Herning.

Nucifraga caryocatactes v. macrorhynchus.

Nøddekriger viste sig i Efteraaret 1911 i betydelig Mængde, som det synes over alle Landets Dele. Til Museet indkom følgende Individer:

Et Expl. skudt ved Refsnæs Fyr 24de September 1911 af C. F. V. Jensen; i Oktober og November saa han ligeledes flere Nøddekriger i Fyrets Nærhed, undertiden i Flokke paa omtr. 20 Stkr.

En ung Hun blev skudt 7de Oktober 1911 i Farum af frh. Møller J. P. Jørgensen.

En Han blev skudt 14de Oktober 1911 i Boserup Skov ved Roskilde af Stud. med. Ed. Collin.

To gamle Hunner bleve skudte i Rude Skov ved Holte 27de Oktober 1911. (R. Hørring).

To Expl. (deraf den ene en gammel Hun) bleve skudte i Boserup Skov 16de November 1911 af Stud. med. Collin; han havde set endel af dem.

En Han blev skudt 24de November i Rude Skov; samme Dag saas en Nøddekrige flyve højt over Skoven. (R. Hørring).

En ung Hun, skudt 4de Januar 1912 i Holte, hvor den overraskedes gaaende mellem Hønsene i en Hønsegaard, modtoges fra Conservator J. E. C. Scheel. Hele Efteraaret havde Nøddekriger stadig været at se i Geel Skov ved Holte.

Hirundo rustica.

Fra Lærer Tejlbjerg i Nivaa modtog Museet en fuldkommen hvid ung Landsvale, født paa Nivaagaard og set der til sin Død

(1911.)

1ste Oktober 1911. — 17de September 1912 saas en ligeledes renhvid Landsvale flyve i Tømmerup Overdrev paa Amager (R. Hørring).

Parus cristatus.

Distriktslæge A. Bertelsen iagttog flere Gange Topmejser ved Vejlefjord Sanatorium i Vinteren 1911—12. Reservelæge K. Schäffer har venligst meddelt følgende Enkeltheder om dens Ynglen sammesteds; han iagttog Fuglen første Gang nær Ynglestedet i Slutningen af Marts eller Begyndelsen af April 1912, da et enkelt Individ færdedes i Granerne; derefter saas jævnligt en eller to i Følge; 12te Maj og senere saa han et Individ flyve ud af et Hul i et gammelt Piletræ; 1ste Juni og senere saas samme-steds 2 Topmejser med Foder i Næbet hoppe ud og ind af samme Hul, hvorfra Ungerne hørtes at pibe; efter at Ungerne vare fløjne af Reden, undersøgte han 11te Juni denne nøjere; nævnte gamle Pil, der sammen med andre danner et Gærde om en Strandeng, er kun skilt fra Strandkanten ved en smal Gangsti; Redehullet var c. 150 cm. fra Jorden; Reden sad c. 15 cm. inde og var bygget af Mos og hovedsageligt udforet med Faareuld; i Reden fandtes et ikke udruget Æg. Nær Redestedet fandtes store Granplantager.

Praticola rubicola.

Fra Conservator Scheel har Museet erhvervet Skindet af en Sortstrubet Bynkefugl, Han, skudt i Omegnen af Ribe i August 1903.

Luscinia vera.

En Sydlig Nattergal, udvokset Hun, faldt 25de Maj 1911 ved Kjels Nor Fyr; sml. S. 175. Skindet i Zoologisk Museum.

Fra Færøerne.

Tveraa. Intet Fuglefald. — E. B. Jacobsen.

Sumbø. Oktober: *16de.* Stille, Taage. Flokke paa flere Hundrede Smaafugle fløj omkring Fyret. *24de* Ø. 4. Overtrukket.

(1911.)

En Svenske (*Ligurinus chloris*) faldt og nedsendtes til Museet. ***30te*** S. Ø. 4. Skyet. Flere Flokke Graagæs i Nærheden af Fyret. ***31te*** S. Ø. 3. Regn. Smaafugle paa Ruderne; ingen faldt. — November: ***1ste*** N. 1. Skyet. En Vandrikse faldt (ikke indsendt.). — J. Jacobsen.

Tofte. Intet Fuglefald. — Simon Thorkildshøj.

Kalsø. Intet Fuglefald. — Joen Clementsen.

25. 9. 1912.

Additions and Corrections to the paper: On a new Gymnoblastic Hydroid *(Ichthyocodium sarcotretis)* epizoic on a new Parasitic Copepod *(Sarcotretes scopeli)* infesting *Scopelus glacialis* Rhdt.

By

Hector F. E. Jungersen.

I am sorry to have made a wrong statement in the paper named above saying on p. 3: "In the Davis Strait it (ɔ: the *Sarcotretes*) seems not to occur; among some 330 specimens of *Scop. glacialis* collected by the "Tjalfe" W. of Greenland, between ca. 63° and 71° Lat. N., none were found infested." This is not true.

A few days ago Mr. Ad. Jensen found some tubes which had been set apart from the material of *Scopelus glacialis* from the "Tjalfe-Expedition" handed over to me for examination. Evidently Mr. Jensen had forgotten the fact that he himself had observed the parasite and picked out the infested specimens of *Scopelus*, including them among the Crustaceans which were to be given to the Division of Arthropods of our Museum. Thus I naturally could not find parasites in any of the ca. 330 *Scopel. glacialis* caught between 63° and 71° Lat. N., every infested specimen having been taken out beforehand, and I think I cannot be blamed for the error I am now going to correct.

The tubes contained 9 *Scopelus glacialis*, from 20 to 52 mm. in length, each carrying an adult female of *Sarcotretes scopeli*;

one specimen had besides a pupal stage (C) attached to the margin of the right gill-cover (like the single case previously found and mentioned on p. 16 of my paper); another carried a Cyclops-stage (A) in front of the right ventral fin, and on the bottom of the tube was found one more of the same stage (A), dropped off from its host.

The adult female *Sarcotretes* of the *Scopelus* with the Cyclops-stage is coated with a beautiful colony of *Ichthyocodium*, while the remaining 8 are without any Hydroid. The basal membrane of the new *Ichthyocodium* encloses completely the external part of the *Sarcotretes*; it is thicker than in any specimen hitherto found, and its anastomosing tubes are numerous and often provided with blindly ending branchlets. A large number of the polypes are long (ca. 2 mm.) and slender; many or most of them carry medusæ-buds basally. The largest medusæ-buds are somewhat more advanced than those previously observed, not only larger (ca. 0,8 mm. in length, 0,224 mm. broad) but more medusiform, and attached by means of a longer and slender stalk; indications of a pair of additional marginal tentacles are quite distinct; thus my assumption (l. c. p. 23) that the medusæ, when liberated, might possess 4 marginal tentacles has been confirmed. The manubrium has still no mouth-opening, nor have I been able to observe genital cells.

Furthermore, among some Museum specimens of *Scop. glacialis*, captured several years ago at the coasts of Greenland, a single one, 37 mm. in length, labelled: Sukkertoppen, Müller $^{5}/_{6}$ 1890, has been found infested with an adult *Sarcotretes* without Hydroid. Probably it has been brought by some Eskimo to the Colonial Director R. Müller, who in 1889 sent a valuable collection of fishes to the Museum. The colony Sukkertoppen is situated at ca. 65° 25′ Lat. N., 52° 45′ Long. W.

The total number of the *Sarcotretes* in its final, inserted shape examined by me now amounts to 32 instead of 22, that of metamorphosis stages to 37. Of the 10 new adult females 5 protruded dorsally, all in front of the dorsal fin, 5 ventrally.

5 were found on the right, 3 on the left side and 2 in the (ventral) middle line (comp. p. 5).

The localities for the additional specimens are the following:

1. The association of the Parasitic Copepod with the Hydroid.

"Tjalfe's" Station Nr.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
336	64° 06′	55° 18′	1040—1100	900	8/5. 09.

2. The Parasitic Copepod, without the Hydroid.

"Tjalfe's" Station Nr.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
171	70° 41′	52° 07′	735	600	6/8. 08.
346 (2 spec.)	64° 22′	56° 00′		300—600	10/5. 09.
344 } 345 }	64° 22′	55° 48′	1040	750—850	10/5. 09.
336	64° 06′	55° 18′	1040—1100	900	8/5. 09.
30 a.	63° 04′	56° 32′		375	7/6. 08.
434 (2 spec.)	62° 53′	54° 15′	1660	900—1125	9/6. 09.
Sukkertoppen	65° 25′	52° 45′			1889.

3. Stages in Development of the Parasitic Copepod.

A. Cyclops-stage.

"Tjalfe's" Station Nr.	Lat. N.	Long. W.	Depth of the Station in Metres	Depth of the Capture in Metres	Date
336 (2 spec.)	64° 06′	55° 18′	1140—1100	900	8/5. 09.

C. 2nd pupal stage

434	62° 53′	54° 15′	1660	900—1125	9/6. 09.

Thus, the northern range of the *Sarcotretes* has been widened from 65° Lat. N. to 70° 41′ L. N., the western extension from 48° 26′ Long. W. to 56° 32′ Long. W. (cfr. l. c. p. 3); that is to say: this Parasitic Copepod not only occurs east and south of Greenland but also west of Greenland through the whole of Davis Strait right up to the entrance of the Umanak Fjord, now the

northernmost point recorded for its capture as well as for that of *Scopelus glacialis* (at Greenland). At the same time the area of the *Ichthyocodium* has been extended from 61° 49′ Lat. N. to 64° 06′ L. N., and from 14° 11′ Long. W. to 58° 18′ L. W. Probably the geographical distribution of this Hydroid will prove to be quite the same as that of the *Sarcotretes*.

9.—11.—1912.

Undersøgelser over entoparasitiske Muscidelarver hos Arthropoder. II.

Af

Dr. ***J. C. Nielsen.***

Phryxe Rob Desv.

Slægten omfatter kun et mindre Antal Arter, hvis Værter, saavidt vides, er Sommerfuglelarver. Den eneste Art, om hvis Udvikling der foreligger udførligere Meddelelser, er den videst udbredte og hyppigst forekommende Art, *Ph. vulgaris* Fall, der angives som klækket af et betydeligt Antal forskellige Sommerfuglelarver, samt — men utvivlsomt med Urette — af en Løbebille (*Procrustes coriaceus* L.). Pantel[1]) henfører Arten til den sjette af de Grupper, hvori han efter Forplantningsmaaden inddeler de parasitiske Muscider, en Gruppe indeholdende Arter, der paa deres Værter enten afsætter Æg, i hvilke Larverne er fuldstændig udviklede, eller selve de udviklede Larver. Æggeskallen angives som blød og bøjelig, langstrakt, i Tværsnit rund, med noget tykkere Overside end Underside. Larven lever i første Stadium frit i Værten, men gennemborer senere Væggen til en af de større Trachéer; fra Hullet udgaar en Kitintragt, paa hvis Yderside findes et yderst fint Lag Epithelceller. Tragten omgiver Larvens Bagende, og denne ligger helt indhyllet i en Sæk af degenereret Fedtvæv. Naar Larven har hæftet sig fast i Nærheden af et Spirakel, øde-

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[1]) I. Pantel: Recherches sur les Diptères à larves entomobies I (La Cellule XXVI 1910 p. 77, 81, 112, 122).

lægger den ved Tryk hele det Parti Trachéer, der findes ved dette Spirakel, og udvendig fra ses dette da omgivet af en mørk Plet.

Jeg har kun haft Lejlighed til at undersøge Udviklingen af *Ph. vulgaris* Fall, der saavidt mig bekendt er den eneste af Slægtens Arter, der hidtil er fundet her i Landet.

Phryxe vulgaris Fll.[1]).

Udvikling.

Larven i 1ste Stadium: Længde c. $^3/_4$ mm. Forrandene af 2.—4. Led med brede Tornbælter, Forrandene af 5.—11. Led paa Bugsiden med smalle Bælter, Bagrandene af 5.—11. Led paa Bugsiden med Bælter, der bliver bredere henimod Larvens Bagende. Svælgskelettets forreste Del langstrakt og smalt, Spidsen bøjet i en næsten ret Vinkel (Fig. 1). Den forreste Del (ɔ: foran Udspringet af de nedre Svælgplader) omtrent Halvdelen af hele Svælgskelettets Længde.

2det Stadium: Længde 3 mm. Forrandene af 2.—4. Led med brede, 5.—11. Led med smallere Tornbælter, der paa 5.—6. Led findes baade paa Ryg- og Bugsiden, paa 7.—11. kun paa Bugsiden; Bagrandene af 5.—11. Led med Bælter, der kun paa 11. Led naar op paa Rygsiden. 12. Led med et bredt Bælte. Mundkrogene slanke, bøjede, Roden fortil med en svær, noget fremadrettet Torn og bagtil med en svagere, bagudrettet Tand (Fig. 2). Svælgskelettet dobbelt saa langt som Mundkrogene. Forspiraklernes atrium (Fig. 3) langstrakt, den inderste Halvdel svagt opsvulmet, Spidsen med to Knopper. Bagspiraklernes atrium krummet, Knopperne dybt adskilte, paa Midten opsvulmede.

3die Stadium. L. 7—11 mm. Forranden af 2det Led med et svagt Bælte, 3.—4. Led med bredere, i hvilke Tornene staar i nogenlunde lige Rækker, 5.—11. Led med smallere Bælter med Tornene i korte Buer, Bagranden af 5.—11. Led med smalle Bælter, der paa 11. Led naar op til Rygsiden, 12. Leds Forrand

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[1]) De i nærværende Afhandling behandlede Arter er bestemte af Dr. J. Villeneuve.

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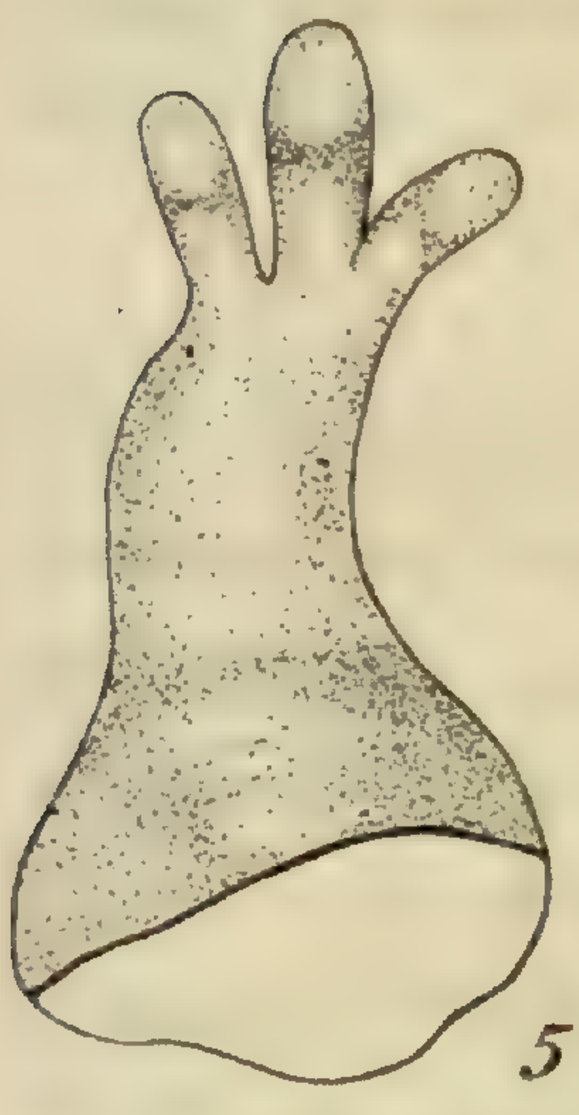

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Phryxe vulgaris Fll.

Fig. 1. 1. Stad. Svælgskelet. 2. 2. Stad. Svælgskelet. 3. 2. Stad. Forspirakel. 4. 3. Stad. Svælgskelet. 5. 3. Stad. Forspirakel. 6. 3. Stad. Bagspirakel.

med et bredt Bælte. For og bag Bagspiraklerne findes Tornrækker (Fig. 6), i hvilke Tornene aftager i Størrelse udadtil, og som gaar over i Tornbæltet paa Leddets Forrand. Foran hvert Spirakel findes en lille Kitinplade med et Par større Torne, undertiden findes ogsaa en eller to saadanne Plader bagved Spiraklerne. Mundkrogene (Fig. 4) plumpe; Inderranden paa den bageste Halvdel med et svagt Fremspring, overfor denne paa Yderranden en lille Knude; Roden for og bag med en bagudrettet Tand. De forreste Svælgplader halvt saa lange som Mundkrogene, de øvre af disses Længde. Forspiraklernes atrium (Fig. 5) bredt ved Roden, derefter indsnævret saaledes, at Spidsen er omtrent halv saa bred som Roden, endende med 3 korte Knopper; Spiraklet sidder indsænket i en lille Fordybning.

Bagspiraklerne (Fig. 6) af den almindelige, tredelte Type. Aandefelterne lige og regelmæssige, Trachéeaabningen skudt op i Indbugtningen i den inderste Bro.

Tøndepuppen: L. 7—8 mm. Bredde c. $2^1/_2$ mm. Sort; Overfladen glat og glinsende; hverken For- eller Bagspiraklerne fremstaaende. Gattet synligt som en meget lille, ubetydeligt fremspringende, sort Knop. De ydre Puppespirakler findes som ganske svage, mørke Knopper ved Bagranden af 5te Led. Analpapillen uregelmæssig 5-kantet, noget større end et Spirakel.

Biologi.

Jeg har fundet Larven snyltende om Foraaret hos Larverne af *Cheimatobia brumata* L., *Hibernia defoliaria* L. og *Drybota protea* Bhk. og om Efteraaret hos Larverne af *Eremobia ochroleuca* Esp., *Orgyia antiqva* L. og *Eupithecia innotata* Hfn.

Mine Iagttagelser har bekræftet Pantel's Meddelelser, med Undtagelse af hans Angivelse af Artens Æglægning, idet det af hans Afhandling synes at fremgaa, at han mener, at Snyltefluen lægger Æg paa Værten. Det er imidlertid aldrig lykkedes mig at finde Æg eller Spor til saadanne paa de af mig undersøgte inficerede Værtlarver.

Snylternes Tilstedeværelse i Værterne giver sig først til Kende ved smaa, uregelmæssige, sortfarvede Pletter paa Huden (Fig. 7 a), der angiver de Steder, hvor Snylterne har boret sig ind. Nogle Dage efter Indboringen fremkommer der omkring nogle af Spiraklerne uregelmæssig formede mørke Pletter (Fig. 7 b), der i Overensstemmelse med Pantel's Angivelser hidrører fra, at Snylterne har gennemboret og fæstet sig til de fra de paagældende Spirakler udgaaende Trachéestammer.

Arten har mindst to Generationer om Aaret. Hos Larven til *Drybota protea* Bhk. var Udviklingen følgende: Værtlarver med

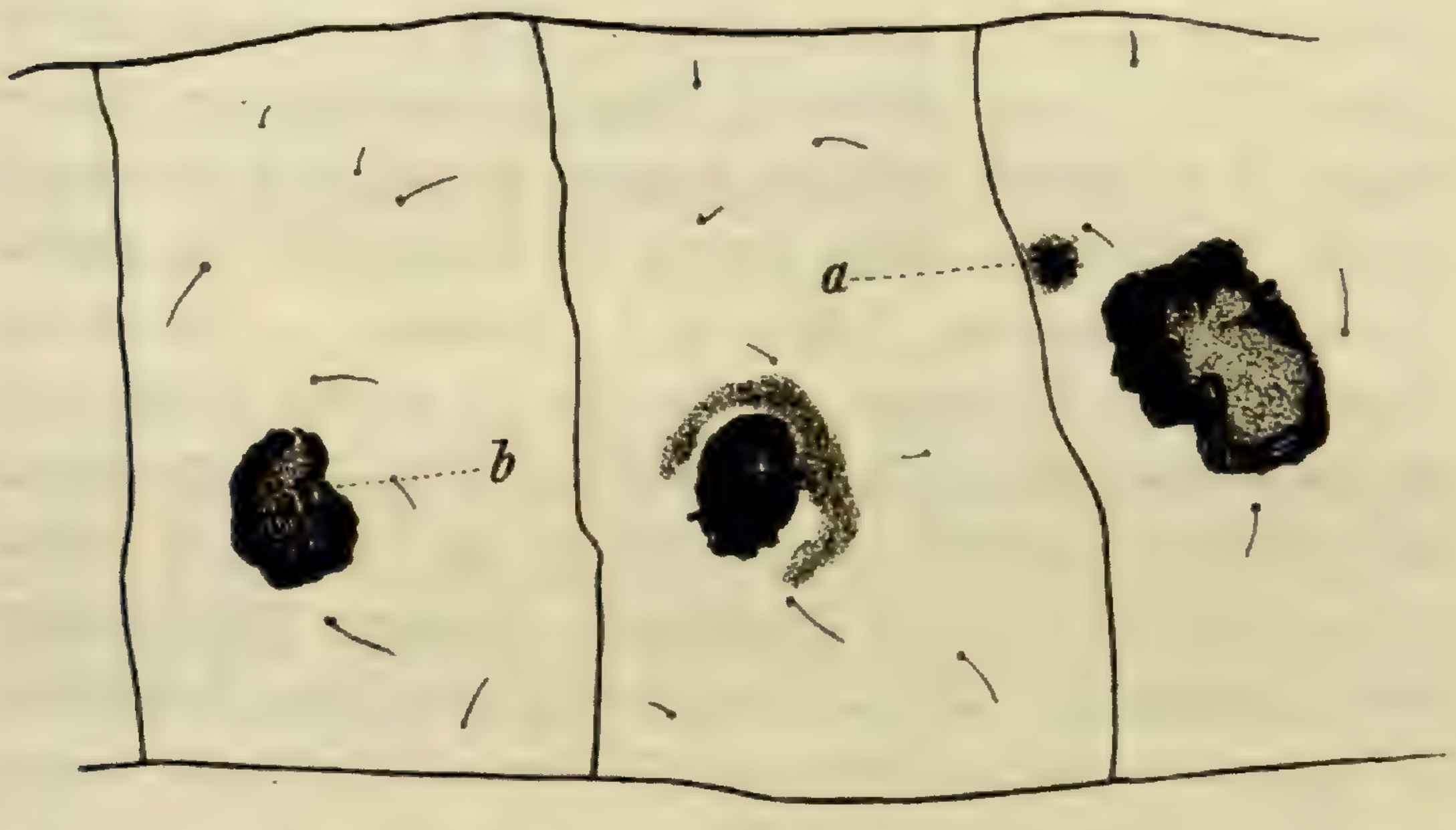

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Fig. 7. Hud af en *Drybota*-Larve med *Phryxe*-Larvens Indboringshul (*a*) og Spirakler (*b*) omgivne af en mørk Plet, fremkaldt af *Phryxe*-Larven.

Indboringshuller indsamledes den 9. Juni. Pletterne omkring Spiraklerne viste sig d. 13.—14. s. M., Snyltelarverne var fuldvoksne d. 16., og de fuldt udviklede Fluer kom frem den 30 s. M. De tilsvarende Tidspunkter var for en den 23. Juni indsamlet Værtlarve d. 25. og 29. s. M. og 12. Juli.

De Snyltere, der lever i Sommerfuglelarver, hvis Ædeperiode falder sent paa Efteraaret, som *Eupithecia innotata* Hfn., er først fuldvoksne sent paa Aaret og overvintrer som Pupper. De voksne Larver borer sig ud af Værterne og forpupper sig i Jorden.

Paa *Drybota*-Larverne fandtes indtil 12 Indboringshuller, men det højeste Antal Fluer, der kom til fuld Udvikling i den samme Vært, var 4. Hos *Eupithecia innotata* Hfn. udvikledes kun ét Eksemplar af Snylteren i hver Værtlarve.

Tachina Meig.

Den første Meddelelse om Udviklingen hos en Art af Slægten *Tachina* skyldes Th. Hartig[1]), der (1837) meddelte, at han havde klækket *T. larvarum* L. af et Antal forskellige Sommerfuglelarver, samt at Larverne levede enlig i smaa Værter, medens der i større kunde findes indtil 10 Larver sammen. Efter at Laboulbène[2]) derefter (1861) havde beskrevet sidste Larvestadium og Tønde-puppen af en *Tachina*, som han henførte til den af Meigen opstillede *T. villica*, der senere har vist sig identisk med den stærkt varierende *T. larvarum*, findes der i Literaturen — bortset fra Beretninger om Klækninger — kun faa og spredte Meddelelser om *Tachina*-Arternes Biologi og Udvikling. I en lille Afhandling, der indeholder foreløbige Meddelelser om de ved Gipsy moth parasite laboratory i Massachusetts foretagne Undersøgelser over Snyltefluer har C. H. T. Townsend[3]) givet korte Meddelelser om nogle Arters Æg og Æglægning (*T. larvarum* L., *T. utilis* Towns. og *T. clisiocampæ* Towns.), og Pantel[4]) henfører *T. larvarum* L. og *T. rustica* Fall. til en Gruppe Arter, der aflægger store hvide Æg paa Værterne. I Sommeren 1911 udkom en stor Beretning af Howard & Fiske om de ved Gipsy moth parasite laboratory indtil da opnaaede Resultater med Indførelse til

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[1]) Th. Hartig: Ueber die parasitischen Zweiflügler des Waldes (Jahresbericht über die Fortschritte der Forstwissenschaft im Jahre 1836—37, 1837, p. 275).

[2]) A. Laboulbène: Métamorphoses d'une Mouche parasite. (Ann. Soc. entom. de France. 4 Série, Tome 1, 1861, p. 231).

[3]) C. H. T. Townsend: A Record of Results from Rearings and Dissections of Tachinidæ (U. S. Dept of Agriculture. Bureau of Entomology Technical Series No. 12, Part VI).

[4]) J. Pantel l. c. p. 34.

Nordamerika af *Porthesia dispar* L. og *Euproctis chrysorrhoea* L.'s Snyltere [1]). Her findes et Par korte Meddelelser om *T. larvarum* L.; Larven forlader Æggeskallen gennem et uregelmæssigt Hul i den ene Pol og borer sig ind gennem Værtens Hud. Den fuldvoksne Snyltelarve forlader altid Værten, forinden den forpupper sig, i hvilket Forhold den siges at afvige fra den nærstaaende *Tricholyga grandis* Zett., der som Regel forpupper sig inde i Værten. Med Hensyn til den af mig i 1909 [2]) beskrevne Larve af *T. larvarum* L. henviser jeg til en senere Berigtigelse [3]), efter hvilken den paagældende Larve har vist sig at tilhøre en anden Snylteflueart (*Ernestia radicum* F.).

Alle de her behandlede Arter har jeg fundet snyltende hos Sommerfuglelarver; de henhører alle til Pantel's 1ste Gruppe, der omfatter: „Espèces collant sur le corps de l'hôte un œuf court, macrotype". Larverne aabner Æggeskallerne ved i den ene Pol at skære et uregelmæssigt Laag af Æggeskallernes Overside.

Laaget frembringes ved Hjælp af Spidsen af Svælgskelettets Tand, der paa den øverste Rand er fint savtakket [4]), (Fig. 12). Efter at Larven har aabnet Æggeskallen, borer den sig ind i Værten. Dens Forhold til denne svarer ganske til hvad jeg tidligere har fremstillet for *Ptychomyia selecta* Meig.'s Vedkommende.

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[1]) L. O. Howard & W. Fiske: The importation into the United States of the Parasites of the Gipsy Moth and the Brown Tail Moth (U. S. Dept of Agriculture, Bureau of Entomology Bulletin No. 91).

[2]) J. C. Nielsen: Iagttagelser over entoparasitiske Muscidelarver hos Arthropoder (Entomol. Meddelelser 2. Række, Bd. 4, 1909 p. 60).

[3]) J. C. Nielsen: A correction concerning Tachina larvarum L. to „Iagttagelser over entoparasitiske Muscidelarver hos Arthropoder" (Ibid. p. 367).

[4]) Pantel (l. c. p. 44) synes at mene, at Svælgskelettets Savtakning særlig spiller en Rolle ved Gennemboringen af Værtens Hud; jeg er nærmest tilbøjelig til antage, at den kun — eller ialtfald fortrinsvis — kommer til Anvendelse ved Æggeskallens Aabning; Tænderne savnes — saavidt hidtil bekendt — hos de Larver, der borer sig ind i Værten gennem et Hul i Æggeskallens Bund, og findes kun hos dem, der forinden de borer sig ind aabner Æggeskallen ved at skære et Laag af eller frembringe et stort Hul i denne.

Tachina larvarum L.

Æ g g e t. *Æggeskallen* (Fig. 8) er c. $^3/_4$ mm. lang og c. $^1/_2$ mm. bred, hvid, uden Skulptur. Formen er aflang-oval eller noget ægformet. Undersiden flad, Oversiden hvælvet. I Æggets forreste Pol har jeg et Par Gange fundet et lille Vedhæng (Fig. 8 a), der formentlig er det samme Organ som P a n t e l[1]) betegner som c o n d u c t e u r m i c r o p y l a i r e, og som han hos flere Snyltefluer har fundet paa Æg, der var dissekerede ud af Fluerne eller ganske nylig lagte. Som Figuren viser, har jeg fundet Vedhænget ogsaa paa Æg, hvori Larven allerede er fuldt udviklet. Hos andre *Tachina*-Arters Æg har jeg ikke bemærket det.

Fig. 8.
Tachina larvarum L.
Æg med en fuldt udviklet Larve. *a*. Vedhænget i Æggeskallens ene Pol.

L a r v e n i 1 s t e S t a d i u m: Længden af den i Ægget liggende Larve er ca. $^2/_3$ af Æggeskallens, og Larven tiltager ikke synderligt i Størrelse i dette Stadium. Forranden af 2.—11. Led med brede, regelmæssige Tornbælter, af hvilke de, der findes paa 2.—5. Led, bestaar af større og tættere sammenstillede Torne end Bælterne paa de følgende Led; Bagrandene af (6). 7.—11. Led med svagere Bælter, i hvilke Tornene er mindre end i Bælterne paa Forrandene. Paa de mellemste Leds Sider undertiden enkelte isolerede Partier af større Torne; 12. Led undtagen Spidsen omkring Spiraklerne besat med større og mindre Torne, der samler sig i uregelmæssige Bælter.

I 12. Leds Bagrand findes 2 smaa Kitintappe og paa Undersiden i en Bue over Midten af Leddet 4 lignende Tappe (Fig. 9); disse er langstrakte, cylindriske og noget bredere ved Roden (Fig. 10). Deres Betydning er mig uklar; de findes kun hos Larver i 1ste Stadium, men forekommer foruden hos Slægten *Tachina*

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[1]) J. Pantel l. c. p. 42—43.

tillige hos flere andre Snyltefluer (*Ptychomyia selecta* Meig., *Bactromyia aurulenta* Meig., *Carcelia gnava* Meig. o. a.). Deres Forekomst falder, saavidt jeg kan se, sammen med Forekomsten af Savtakningen paa Svælgskelettets Tand; denne findes — som ovenfor berørt — hos saadanne Arter, der aabner Æggeskallen andre Steder end i Bunden, og hvis Indboringshul ligger helt eller delvis udenfor Æggeskallen, medens Svælgskelettets Tand er glat hos de Arter, der trænger ind i Værterne gennem Æggeskallens Bund. Man kan

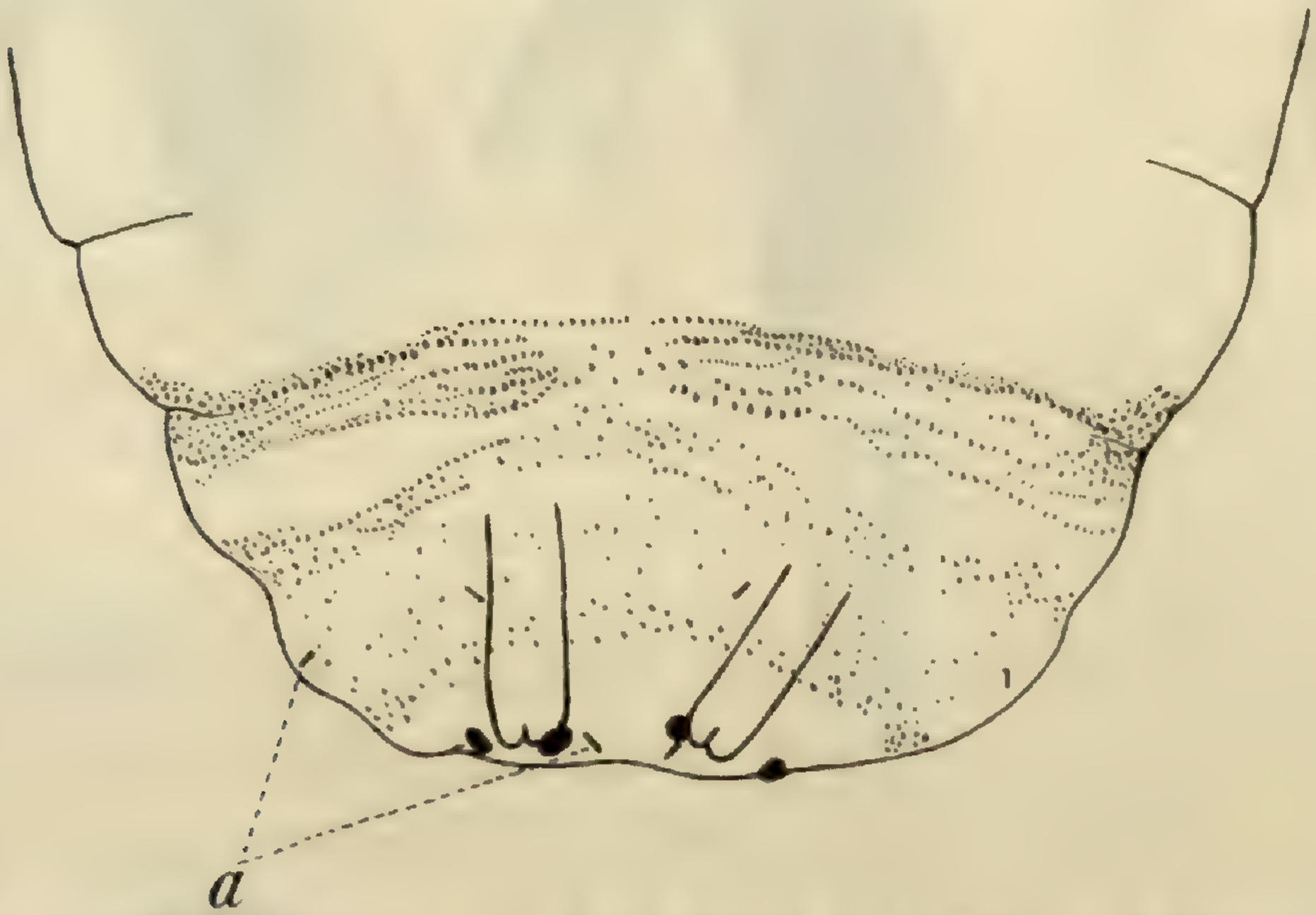

Fig. 9. *Tachina larvarum*. Bagenden af en Larve i 1ste Stadium.
a. Kitintappene.

maaske antage, at Tappene tjener til at støtte eller fastholde Larven i den Periode, i hvilken den har strakt sig ud af Æggeskallen og er beskæftiget med at frembringe Hullet i Værtens Hud.

Svælgskelettets forreste Del (foran Udspringet af de nedre Svælgplader) udgør Halvdelen af hele Længden og danner en stump Vinkel med den bageste Del (Fig. 11). Svælgpladerne er omtrent lige lange. Ved Siden af hvert Bagspirakel findes to smaa, uregelmæssige, sorte Kitinplader; Bagspiraklernes atrium er cylindrisk, omtrent 3 Gange saa langt som bredt.

2det Stadium: Længde 3—4 mm. Tornbælterne findes paa Forrandene af 2.—11. Led; de er bredest paa 2. og 3. Led og af-

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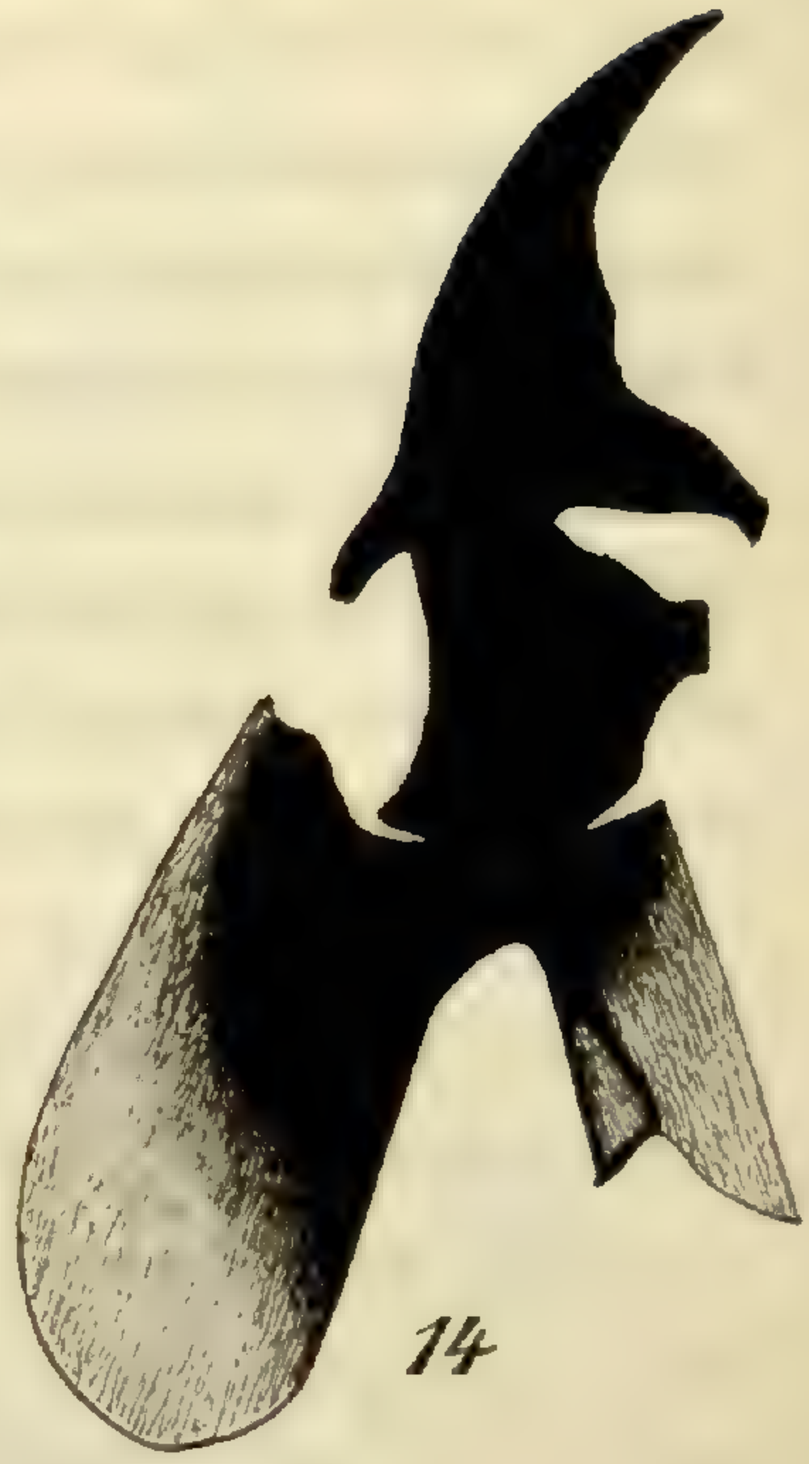

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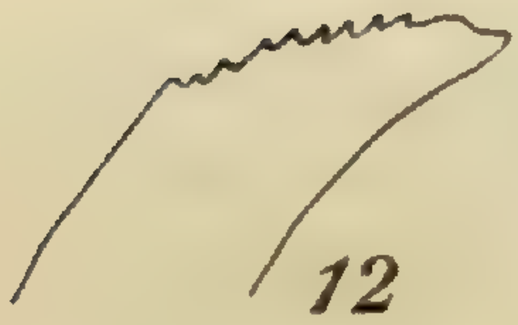

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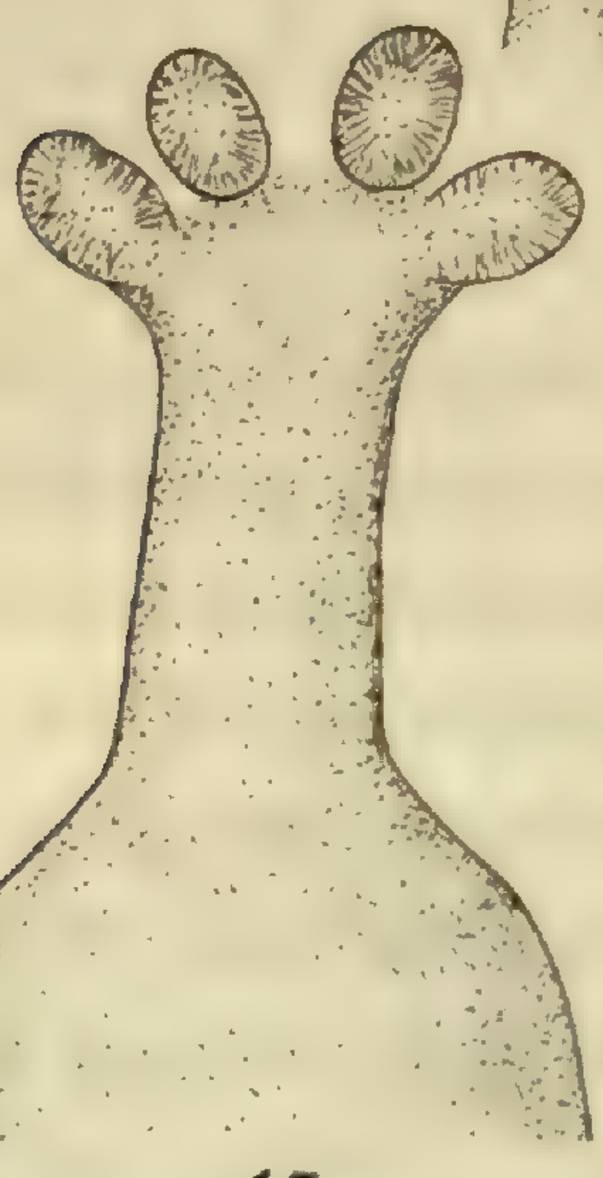

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Tachina larvarum L. Fig. 10. 1. Stad. Hud fra 12. Led med Torne og to Kitintappe. 11. 1. Stad. Svælgskelet. 12. 1. Stad. Spidsen af Svælgskelettet. 13. 2. Stad. Svælgskelet. 14. 3. Stad. Svælgskelet. 15. 3. Stad. Forspirakel. 16. Spidsen af et Forspirakel set fra Siden. 17. 3. Stad. Bagspirakel. 18. Tøndepuppe, Bagspiraklerne og Analtappen.

tager stærkt i Bredde bagud og forsvinder paa Rygsiden af 6.—11. Led; Bagrandene af 7.—11. Led med Tornbælter, der er smallest paa 7. Led, hvor Bæltet kun findes paa Bugsiden, og tiltager bagud i Bredde; 12. Led, undtagen Forranden og Spidsen, besat med Torne. Mundkrogenes Rod bagtil afrundet, fortil knudeformet, Inderranden temmelig skarpt vinkelbøjet, hen imod Roden med en lille Knude. Svælgskelettet c. $2^1/_2$ Gang saa langt som Mundkrogene (Fig. 13). De øvre Svælgpladers Rand fortil med et tandformet Fremspring; de nedre Svælgplader mindre stærkt divergerende mod de øvre, saaledes at Svælgskelettet set fra Siden bliver temmelig smalt. Forspiraklerne mangler. Bagspiraklernes atrium cylindrisk, omtrent dobbelt saa langt som bredt, med to Knopper.

3die Stadium: Længde indtil 14 mm. Tornbælterne findes paa Forranden af 2.—11. Led, bredest paa de forreste, og paa Bagranden af 8.—11. Led; 12. Led undtagen omkring Spiraklerne besat med Torne. Mundkrogene saa lange som de øvre Svælgplader; Roden bagtil udtrukket i en kort, bagudrettet Tap og fortil i en svagt bagudrettet Forlængelse, Inderranden nedenfor Midten med en svag Knude (Fig. 14). Forspiraklernes atrium fladt, Roden stærkt udvidet, med 4 eller 5 Knopper (Fig. 15, 16); Antallet kan variere saaledes, at den samme Larve har 4 Knopper i det ene Spirakel og 5 i det andet, men i Reglen findes samme Antal, 4—5, i begge Spirakler. Bagspiraklerne (Fig. 17) tilhører den almindelige Type med 3 Aandefelter; Rammen har et smalt Indsnit ovenfor Trachéeaabningen; der kan træffes Larver, hos hvilke et af Spiraklerne kun har to Aandefelter[1]). Aandefelterne korte, regelmæssige og svagt bøjede[2]).

[1]) Jfr. om lignende abnorme Spirakler hos *Ptychomyia selecta* Meig. J. C. Nielsen 1909, p. 32.

[2]) Fra the Gipsy Moth Parasite Laboratory har jeg bl. a. modtaget et Præparat af Bagspiraklerne fra en Tøndepuppe af *T. larvarum* L., i hvilket det inderste Aandefelt omtrent paa Midten er afbrudt ved en lille Bro; jeg har ikke paa noget af de talrige danske Eksemplarer af *T. larvarum* L., som jeg har undersøgt, fundet nogen tilsvarende Afbrydelse eller Indsnævring af Aandefeltet.

Tøndepuppen: Længde 6—12 mm., Bredde $2^1/_2$—5 mm.; aflang oval, eller cylindrisk, undertiden ganske svagt krummet, noget fladere paa Bugsiden end paa Rygsiden. Overfladen glinsende, fint naaleridset, Forspiraklerne fremstaaende som to smaa spidse Tappe. Bagspiraklerne svagt ophøjede, Analtappen uregelmæssig firkantet, større end et Spirakel (Fig. 18); Gattet tydeligt, men ikke fremstaaende. De ydre Puppespirakler findes som et Par tydelige men smaa Tappe ved Bagranden af 5. Led.

Biologi.

I Sommeren 1911 indsamlede Lærer P. Kryger paa et Sted i Fortunens Indelukke i Dyrehaven, hvor *Zygæna loniceræ* Esp. for nogle Aar siden var optraadt i meget stort Antal, men hvor den nu var i Tilbagegang [1]), 460 Stkr. *Zygæna*-Kokoner, som han overlod mig til nærmere Undersøgelse. Disse Kokoner fordelte sig saaledes:

Kokoner, hvoraf der kom Zygæner	116 Stkr.
— — — — Tachina larvarum L.....	255 —
— — — — forskellige Ichneumoner	35 —
Tomme Kokoner	54 —
	460 Stkr.

Antallet af de paa de enkelte Larver afsatte *Tachina*-Æg varierede fra 1—22; de var hyppigst anbragte fortil paa Larverne, ofte klumpede sammen paa Hovedet og Brystleddene, men fandtes ogsaa længere tilbage paa Værtens Krop og Sugefødder. Det største Antal Fluer, der kom frem af en enkelt Kokon var 4, saaledes at et betydeligt Antal af Æggene eller Larverne maatte være omkomne under Udviklingen.

For at undersøge dette Forhold nærmere aabnede jeg 150 Kokoner, efter at Snylterne var udviklede, og talte de Æg, der fandtes afsatte paa Larvehudene og de Fluepupper, som laa inde i Kokonerne. Sidestaaende Tabel viser Resultatet:

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[1]) Tilbagegangen skyldes efter Hr. Krygers Iagttagelser særlig en lille Proctotrypide, *Telenomus zygænæ* Kieff., der snyltede i Zygænaens Æg.

Af omtrent to Trediedele af Kokonerne kom kun én Snylter ud, trods det at der blandt de Værter, der laa i disse Kokoner, foruden 15 med kun ét *Æg* fandtes Eksemplarer med indtil 16 *Æg* hver; af omtrent en Femtedel af Kokonerne udvikledes to Snyltere; af 11 Kokoner tre og kun af en eneste, der indeholdt en *Zygæna*-Larve med 13 *Æg*, fire Tachinaer.

Foruden disse Snyltefluer klækkedes endvidere 6 Snyltehvepse af Værter, der var besatte med Flueæg. Ialt var paa de 150 Værtlarver afsat 767 *Tachina*-*Æg*, og af Kokonerne klækkedes 144 Fluer (samt 6 Snyltehvepse), saaledes at Antallet af de Snyltefluer, som det lykkedes at fuldføre hele Udviklingen, udgjorde lidt mere end en Femtedel af Æggenes.

Fluernes Størrelse varierede stærkt, de mindste var 5 mm., de største lidt

Tabel over Forholdet mellem de paa *Zygæna*-Larverne afsatte Æg af *Tachina larvarum* L. og de af *Zygæna*-Kokonerne fremkomne Snyltere.

Antallet af klækkede Fluer (Number of flies bred from the cocoons)		Antallet af de paa *Zygæna*-Larverne afsatte Æg. (Number of eggs deposited on the *Zygæna* caterpillars).																					
		1 Æg	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	22				
Tachina larvarum L.	1. Eks.	15	26	16	7	6	9	5	2	3	1	„	3	1	„	3	1	„	„				
	2. —	„	5	7	5	3	2	4	1	„	1	2	1	„	2	1	„	„	1				
	3. —	„	„	„	4	„	„	„	2	1	1	„	„	„	1	1	„	1	„				
	4. —	„	„	„	„	„	„	„	„	„	„	„	„	1	„	„	„	„	„				
Ichneumoner		„	„	„	1	„	1	„	„	„	„	„	„	„	„	„	„	„	„				

over 13 mm. Dette Størrelsesforhold afhænger naturligvis af, om de paagældende Eksemplarer har udviklet sig enligt eller om der har været flere Snyltere i den samme Vært. Dog viste det sig i det sidste Tilfælde, at Fluernes Størrelse ikke reduceredes ligeligt, men at en eller to af dem opnaaede en Størrelse, der ikke afveg fra de enlige Eksemplarers, medens Resten var Dværgeksemplarer. Dette er ogsaa ret naturligt, thi alle Snylterne borer sig ikke ind paa samme Tid; de større Eksemplarer hidrører fra de tidligst indborede Larver, de smaa fra Larver, der er trængte ind i Værter, hvor de tidligere indborede Snyltere allerede har fortæret det meste af Værtens Indhold, men dog levnet saameget, at de andre kunde fuldende Udviklingen, om de end ikke kunde opnaa nogen betydelig Størrelse. Et stort Antal saadanne sent indborede Snyltere dør naturligvis under Udviklingen enten af Mangel paa Næring, pressede ihjel af de ældre Larver, eller af andre Grunde[1]).

De fuldt udviklede Snyltere forpuppede sig — i Modsætning til Howard & Fiske's ovennævnte Meddelelse — saa godt som udelukkende inde i de dræbte Værters Hud, og kun i faa Tilfælde fandtes enkelte Kokoner liggende frit i *Zygæna*-Kokonerne.

Fluerne kom frem 14 Dage til 3 Uger efter Forpupningen.

De ovenfor beskrevne *Zygæna*-Snyltere hører til *T. larvarum*'s Sommergeneration. Om Efteraaret har jeg truffet en anden Generation i Larverne til *Spilosoma lubricipeda* L.; her var Larveudviklingen afsluttet i September Maaned, og Fluerne kom frem enten samme Efteraar eller næste Aar i Mai.

Tachina impotens Rond.

Ægget: Som hos *T. larvarum* L.

Larven i 1ste Stadium: Tornvæbningen som hos *T. larvarum* L. Af de Kitintappe, som hos denne findes paa sidste Led, ses hos nærværende Art tillige et Par paa Undersiden af 2.—11. Led; paa 12. Led findes samme Antal som hos *T. larvarum* (Fig. 19).

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[1]) Jfr. herom og om lignende Forhold J. Pantel l. c. p. 176—177.

Svælgskelettet ikke bøjet; den bageste Del 1/2 Gang saa lang som den forreste; de øvre Svælgplader meget længere end de nedre (Fig. 20), Spidsen bredt afrundet. Bagspiraklerne som hos *T. larvarum* L.

2det Stadium: L. 3—4 mm. Forrandene af 2.—11. Led med Bælter, der er bredest paa 2.—5. Led og meget fine paa 7.—11. Led, paa 6.—11. Led findes de kun paa Bugsiden; Bagranden af (6.) 7.—11. Led med Bælter, der tiltager i Bredde

Fig. 19. *Tachina impotens* Rond. 1. Stad. Bagenden.

bagud; 12. Led med et Tornbælte paa Midten. Mundkrogene noget slankere end hos den foregaaende Art, Knuden paa Inderranden mere fremtrædende (Fig. 21); Svælgskelettet lidt mere end dobbelt saa langt som Mundkrogene, de øvre Svælgplader uden Fremspring paa Randen, de nedre stærkere divergerende mod de øvre end hos *T. larvarum* L. Bagspiraklerne som hos denne Art.

3die Stadium: Længde indtil 14 mm. Forranden af 2.—6. Led med Bælter, der er bredest paa Siderne, 7.—11. Led med Torne kun paa Siderne. 12. Led med et smalt Bælte paa Midten. Mundkrogene kortere end de bageste Svælgplader, noget

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Tachina impotens Rond.

Fig. 20. 1. Stad. Svælgskelet. 21. 2. Stad. Svælgskelet. 22. 3. Stad. Svælgskelet. 23. 3. Stad. Forspirakel. 24. 3. Stad. Bagspirakel.

plumpere end hos *T. larvarum* og med noget stærkere Tand paa Inderranden (Fig. 22). Forspiraklernes atrium fortil bredere end hos *T. larvarum*; Modsætningen mellem Roden og det ydre flad-

trykte Parti mindre end hos den foregaaende Art; 5 Knopper (Fig. 23). Bagspiraklerne afviger fra den nævnte Arts ved, at Rammen springer frem overfor Trachéeaabningen, og ved at Aandefelterne er længere og smallere samt noget stærkere bøjede (Fig. 24).

Tøndepuppen: Længde $5^1/_2$—$8^1/_2$ mm., Bredde $2^1/_2$—4 mm. Kan ikke adskilles fra den foregaaende Arts.

Biologi.

Jeg har fundet denne Art snyltende i Larven af *Orgyia antiqva* L., der i en Række Aar har optraadt paa en Tjørnehæk i Københavns Omegn. I fire Aar — fra 1907 — havde jeg søgt efter Snyltere hos Larverne, der for hvert Aar blev talrigere; først i Slutningen af August 1911 lykkedes det mig at finde et Par enkelte, fuldvoksne *Orgyia*-Larver, der hver bar et Æg af *T. impotens* Rond. Aaret efter, i 1912, var Orgyiaerne tiltagne i Antal og havde næsten helt afløvet en Del af Hækken og nogle indenfor denne staaende smaa Blommetræer. I Løbet af August Maaned lykkedes det mig at indsamle en Del *Orgyia*-Larver med Æg, men de inficerede Larver var i det hele taget sjældne; en løselig Optælling viste, at knap en halv Snes Procent af dem var angrebne af Snylteren. Som Følge af Snylterens Sparsomhed var Larverne hver forsynede med kun ét enkelt Æg — en enkelt dog med to. — Æggene sad næsten alle paa Larvernes Bugside og fortil paa Larven; hos et Par Larver dog paa Sugefødderne.

Æggene aflagdes, som ovenfor sagt, kun paa fuldvoksne Larver. Som Følge heraf skete det hyppig, at Orgyiaerne forpuppede sig, forinden Snylterne var trængte ind, saaledes at de derved undgik at blive dræbte af disse; af samme Grund forpuppede den overvejende Del af Værtlarverne sig, forinden de blev dræbte af Snylterne, saaledes at disse fuldendte deres Udvikling inde i Pupperne.

For 34 *Orgyia*-Larver med Æg, der var indsamlede i Dagene fra 8.—15. August, viste Forholdet sig saaledes:

Forpuppede, førend Tachinalarverne havde boret sig ind	21
Forpuppede, efter at Tachinalarverne var trængt ind	9
Dræbte af Tachinalarverne før Forpupningen	4
	Ialt 34

Efter at Snyltelarven er fuldvoksen, borer den sig ud af *Orgyia*-Puppen og forpupper sig inde i Spindet; en enkelt Puppe fandtes dog inde i Værtens Puppe.

Trods det, at Larveudviklingen foregaar saa sent paa Aaret som i August—September, kommer Fluerne alligevel frem samme Aar i Oktober, efter en Puppetid af c. 1 Maaned.

Tachina macrocera R. D.[1]).

(*T. nitidiventris* Zett.)

Ægget som hos *T. larvarum* L.

Larven i 1ste Stadium: Tornbælternes Fordeling paa Leddenes Forrande svarer til Forholdet hos *T. larvarum* L.; paa Bagrandene af 3.—5. Led paa Rygsiden Bælter, i hvilke Tornene kun er lidt mindre end paa de samme Leds Forrande, paa Bagrandene af 6.—11. Led Bælter, hvis Torne er mindre end de paa Forrandene. Kitintappenes Fordeling som hos *T. larvarum* Rond. Svælgskelettet ligner i høj Grad *T. impotens*, men er noget kraftigere og bagtil noget bredere (Fig. 25); den forreste Del udgør $^1/_3$ af hele Længden.

2det Stadium; Da jeg af dette kun besidder en sammenkrøllet Larvehud, som er udpræpareret af en Tragt, der omsluttede en Larve i 3die Stadium, kan jeg intet meddele om Tornbælternes Fordeling. Mundkrogene er bredere ved Roden, men slankere i Spidsen end hos de to foregaaende Arter; de øvre Svælgpladers Rand fortil med en stor Tand og lidt bagved denne en mindre som hos *T. larvarum* (Fig. 26); Svælgpladerne lidt mere end

[1]) Jfr. J. Villeneuve: Sur Tachina macrocera R. D. (Dipt. Tachin.) Zeitschr. f. wiss. Insektenbiologie Bd. VIII, 1912, p. 296.

dobbelt saa lange som Mundkrogene. Bagspiraklerne som hos denne Art.

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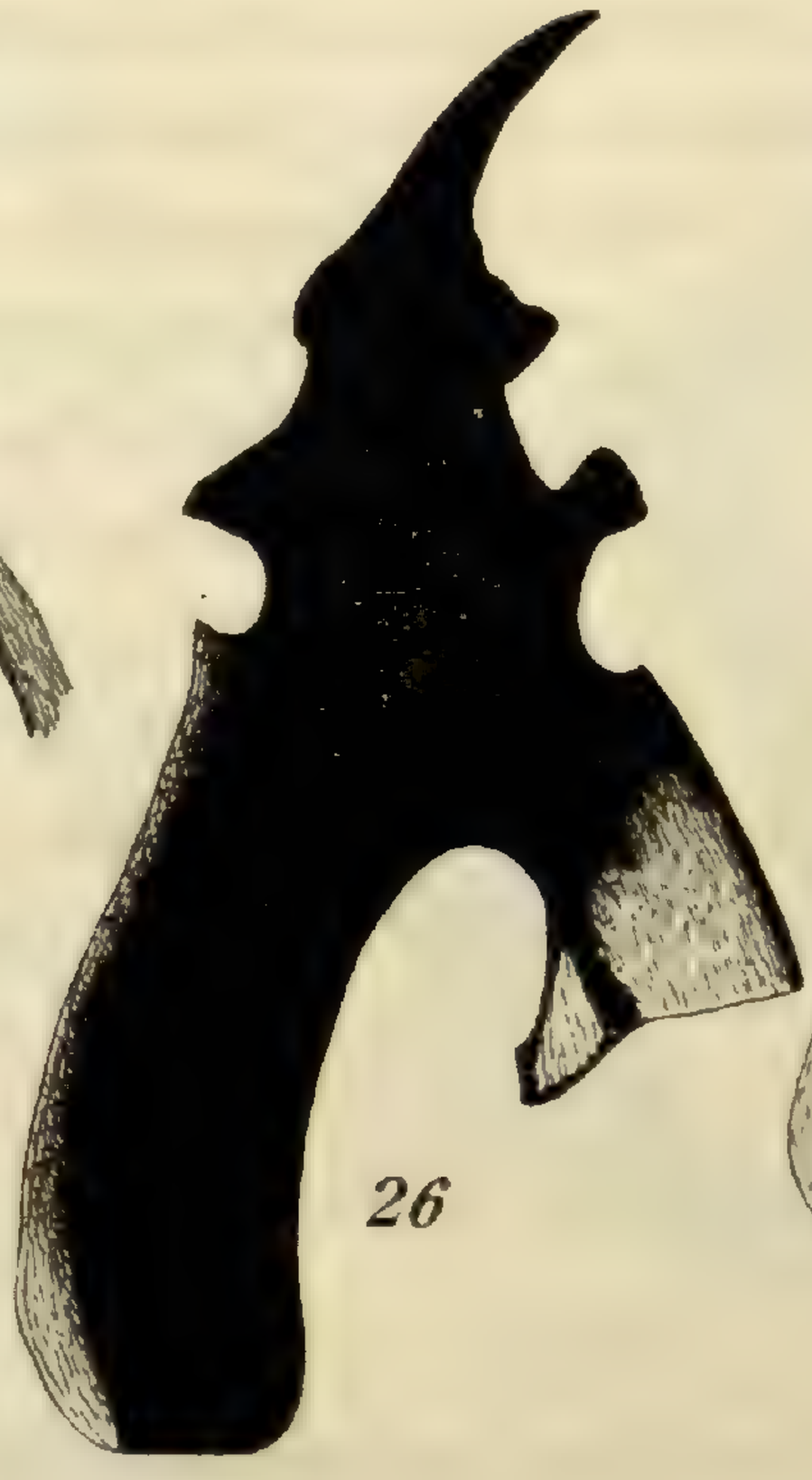

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Tachina macrocera Rob. Dew.

Fig. 25. 1. Stad. Svælgskelet. 26. 2. Stad. Svælgskelet. 27. 3. Stad. Svælgskelet. 28. 3. Stad. Forspirakel. 29. 3. Stad. Bagspirakel. 30. Tøndepuppe; Bagspiraklerne og Analtappen.

3die Stadium: L. indtil 12 mm. Tornbælterne findes paa Forranden af 2.—11. Led, paa 9.—11. dog kun paa Bugsiden, samt

paa Bagranden af 5.—11. Led, paa 5.—8. Led kun paa Bugsiden; 12. Led med et bredt Tornbælte. Mundkrogene kortere end de øvre Svælgplader, omtrent som hos *T. impotens*; Tanden paa Inderranden noget mere fremtrædende end hos denne (Fig. 27). Forspiraklerne slanke, med 5 langstrakte Knopper (Fig. 28). Bagspiraklernes Ramme med en bred Indbugtning overfor Trachéeaabningen; Aandefelterne kortere, uregelmæssige (Fig. 29).

Tøndepuppen: L. c. 7—10 mm. Bredde c. 3 mm. Brunlig, undertiden hos mindre Eksemplarer lys brungul; iøvrigt som hos *T. larvarum* L., dog ligger Bagspiraklerne lidt længere fremme paa Rygsiden af sidste Led end hos denne Art. Analpapillen danner en tværliggende Fure, omgivet af et stærkt tværrynket Felt (Fig. 30).

Biologi.

En Del Eksemplarer af Fluen er hjembragt fra Østgrønland (Hekla Havn) af Amdrup Expeditionen, klækkede af Deichmann af Larverne til *Dasychira groenlandica* Woche (5/1892). „Danmark" Expeditionen hjemførte ligeledes fra Østgrønland (76° 46' N. L.) flere *Dasychira*-Larver med Æg eller Larver af denne Art, indsamlede af Fritz Johansen. Een Larve bar seks Æg paa Siderne eller Undersiden af Thoraxleddene, en anden indeholdt 3 Larver i 3die Stadium, en tredie og fjerde hver en enkelt, ligeledes i 3die Stadium. Alle Værtlarverne var vistnok voksne og skulde have forpuppet sig samme Sommer, som de angrebes af Snylterne.

Jeg har dernæst selv fundet *T. macrocera* R. D. i Juni i Klitterne ved Tidsvilde, hvor den snyltede i fuldvoksne Larver til *Malacosoma castrensis* L. Paa hver Larve fandtes kun et eller to Æg afsatte, og de Værter, som det lykkedes mig at finde, forpuppede sig alle med Snylterne inde i sig. Fluerne kom frem i den første Halvdel af August.

Tachina vidua Meig.

Udvikling.

Tøndepuppen: Afviger fra *T. larvarum* L. ved at Farven er brunlig, samt ved at Analpapillen er mindre end Bagspiraklerne. Disse viser ogsaa nogle Forskelligheder fra den nævnte Art, idet Spiraklets Ramme ovenfor Traheeaabningen er fladt indbugtet, og ved at Broerne er forholdsvis spinklere og Aandefelterne smallere og stærkere bøjede. Ved disse Karakterer vil Larven i 3die Stadium kunne adskilles fra de andre her beskrevne *Tachina*-Arter (Fig. 31).

Fig. 31. *Tachina vidua* Meig.
3. Stad. Bagspirakel.

Biologi.

Klækket af Larven til *Macrothylacia rubi* L.

Digonochæta Rond.

Slægten *Digonochæta* omfatter kun et Par Arter; den ene af disse *D. setipennis* Fall., har været kendt som Snylter hos Ørentviste siden Bohemann[1]) i 1850 og 51 meddelte, at han havde fundet en Ørentvist, hvis Bagkrop var usædvanlig stærkt opsvulmet, samt at han Dagen efter, da Dyret var stukket paa en Naal, fandt en Fluepuppe stikkende frem mellem dens Bryst og Bagkrop, af

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[1]) Bohemann: Iakttagelser rørande några Insektarters Metamorfose (Öfversigt af Kungl. Vetenskaps Akademiens Förhandlinger 7, 1850 p. 211) og Om Utvecklingen af Tachina setipennis (ibid. 8, 1851 p. 153).

hvilken Puppe han i Mai Maaned næste Aar klækkede et Eksemplar af *D. setipennis* Fall.

Faa Aar senere offentliggjorde G. Newport[1]) en lille Meddelelse om en Snylteflue, som han havde klækket af Ørentviste, indsamlede i Londons Omegn; Arten beskrives som ny under Navn af *Metopia forficulæ.* Senere Systematikere har ikke kunnet udrede, hvad det var for en Art, Newport har haft for sig, da hans Beskrivelse er for kortfattet til at gøre den kendelig, og hans Typeeksemplar neppe existerer længere. Det er sikkert, at den ikke er en *Metopia*, og den henføres af Forfatterne til Katalog der paläarktischen Dipteren III med Tvivl til Slægten *Digonochæta.* Dette er imidlertid neppe rigtigt, da *D. setipennis* Fll., som Forfatterne øjensynlig har tænkt paa, ikke lægger sine Æg paa Ørentvistene, medens dette var Tilfældet med den af Newport iagttagne Art.

Næste Gang, Fluelarver i Ørentviste omtales, er da Meinert[2]) i 1863 kort meddelte, at han ved sine anatomiske Undersøgelser af Ørentviste fire Gange havde fundet Fluelarver liggende inde i saadanne, nemlig to Gange hos *Forficula auricularia* L. og to Gange hos *F. acanthopygia* Gené. Denne Meddelelse angaar sandsynligvis *D. setipennis* Fll., men det bør dog bemærkes, at der i Ørentviste ogsaa findes andre Snyltefluer, nemlig *Rhocodineura antiqva* Meig., som Rodzianko[3]) har fundet hos *Forficula tomis* Kol. og *Ceromasia vicinalis* Pand., der af Pantel[4]) opgives som snyltende i Ørentviste.

Digonochæta setipennis Fall. opgives foruden af Ørentviste tillige som klækket af forskellige Sommerfuglelarver. Med Hensyn

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[1]) G. Newport: Notes on the dipterous parasites which attack the common Earwig and the Emperor Moth (Proc. Linn. Soc. London II, 1855 p. 247).

[2]) Fr. Meinert: Anatomia Forficularum, Kbhvn. 1863, p. 30.

[3]) W. Rodzianko: Ueber den Parasitismus der Larven von Roeselia antiqva Meig. im Innern der Larven von Forficula tomis Kol. (Horæ Soc. Entom. Ross. XXXI, 1897, p. 72).

[4]) J. Pantel l. c. p. 46.

til Udviklingen angiver Pantel[1]), at Fluen antagelig lægger sine Æg eller sine Larver paa Steder, hvor Værterne færdes, og at de unge Larver, i hvis Hud er indlejret Kitinplader, selv opsøger Ørentvistene og borer sig ind i disse. Indboringen sker gennem en Ledhud, og Snylteren ligger fæstet til Værten ved en fra Indboringshullets Rande udgaaende Tragt. Ved Hudskiftet bliver de afkastede Ledhude liggende fuldt udstrakte inde i Tragten.

Digonochæta setipennis Fall.

Udvikling.

Larven i 1ste Stadium: Ligesom Pantel har jeg fundet 1ste Stadiums Larvehud liggende udbredt inde i Tragtens Vægge (Fig. 32). Paa Larvehuden fandtes dels en Række efter hinanden følgende store Kitinskiver (Fig. 34), dels nogle fra disse udgaaende Rækker af mindre Plader, samt enkelte Grupper af saadanne mindre Plader. Jeg antager, at de store Kitinskiver har beklædt Bugsiden paa Leddene, og at de derfra udgaaende Rækker har strakt sig op ad Leddenes Sider og at Pladerne paa Rygsiden har samlet sig i Grupper. De store Skiver bestaar af et svagt bøjet, brunligt Kitinstykke, i hvilket er indlejret Rækker af langstrakte, i den bagudvendte Spids stærkere kitiniserede Smaaplader af samme Form som de, der fandtes i Rækkerne og i Grupperne; paa de første 3 Skiver findes Smaapladerne kun i en enkelt Række, men paa de følgende findes 2 eller 3 Rækker. Bag dette Parti bestaar Skiven af et lysere, i Bagranden nedadrundet Parti, der er besat med et Antal smaa afrundede Kitingryn. Foran Skiverne, med Undtagelse af de forreste, findes enkelte smaa, meget spidse bagudrettede Torne, hvis Rod løber ud i en langstrakt, lysere Forlængelse. Svælgskelettet fandtes liggende foran Larvehuden; det bestod af en langstrakt, i Spidsen smallere Plade, der bagtil delte sig i to korte Svælgplader, der i Spidsen var udadbøjede (Fig. 33).

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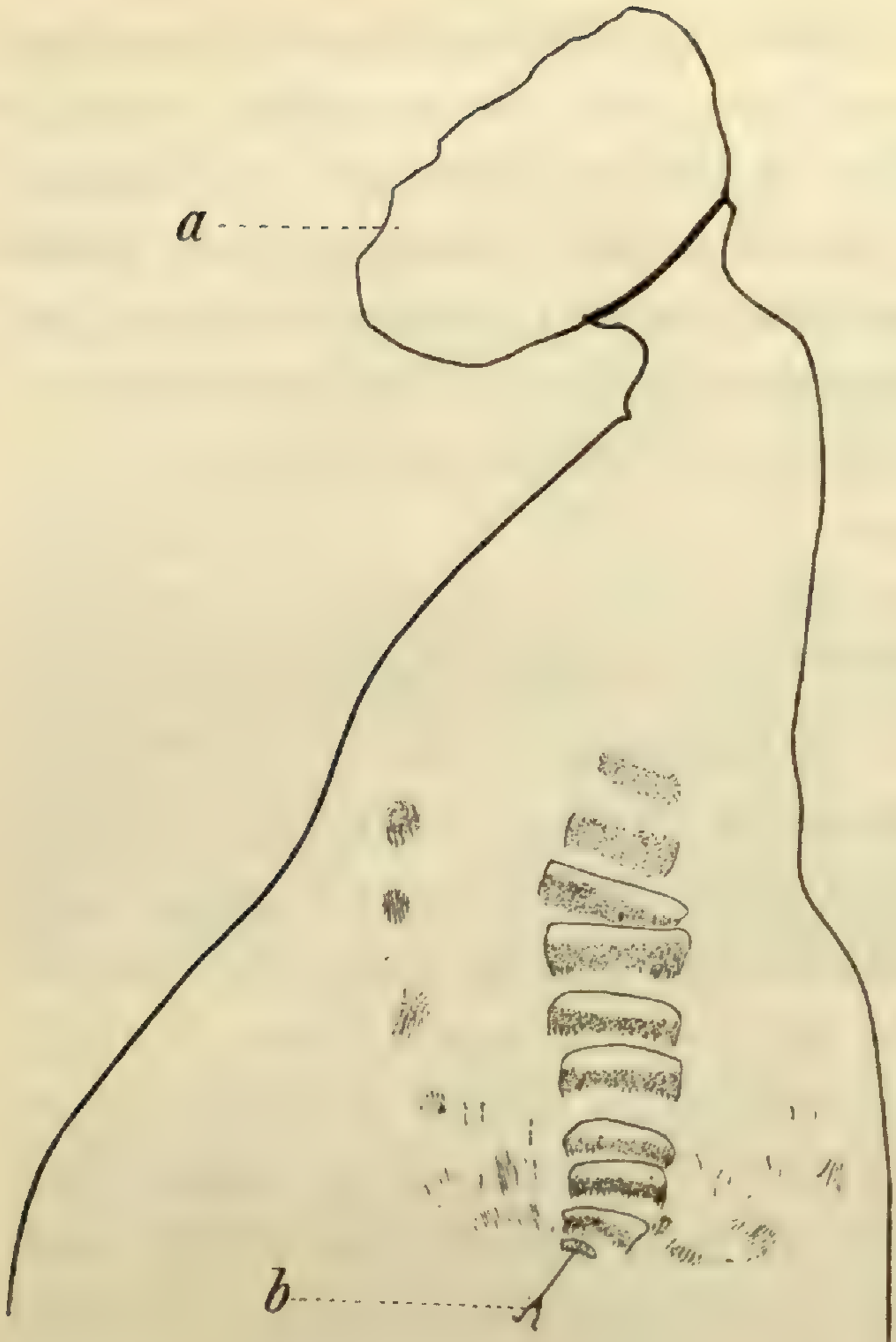
[1]) l. c. p. 176, 77, 101, 110, 125.



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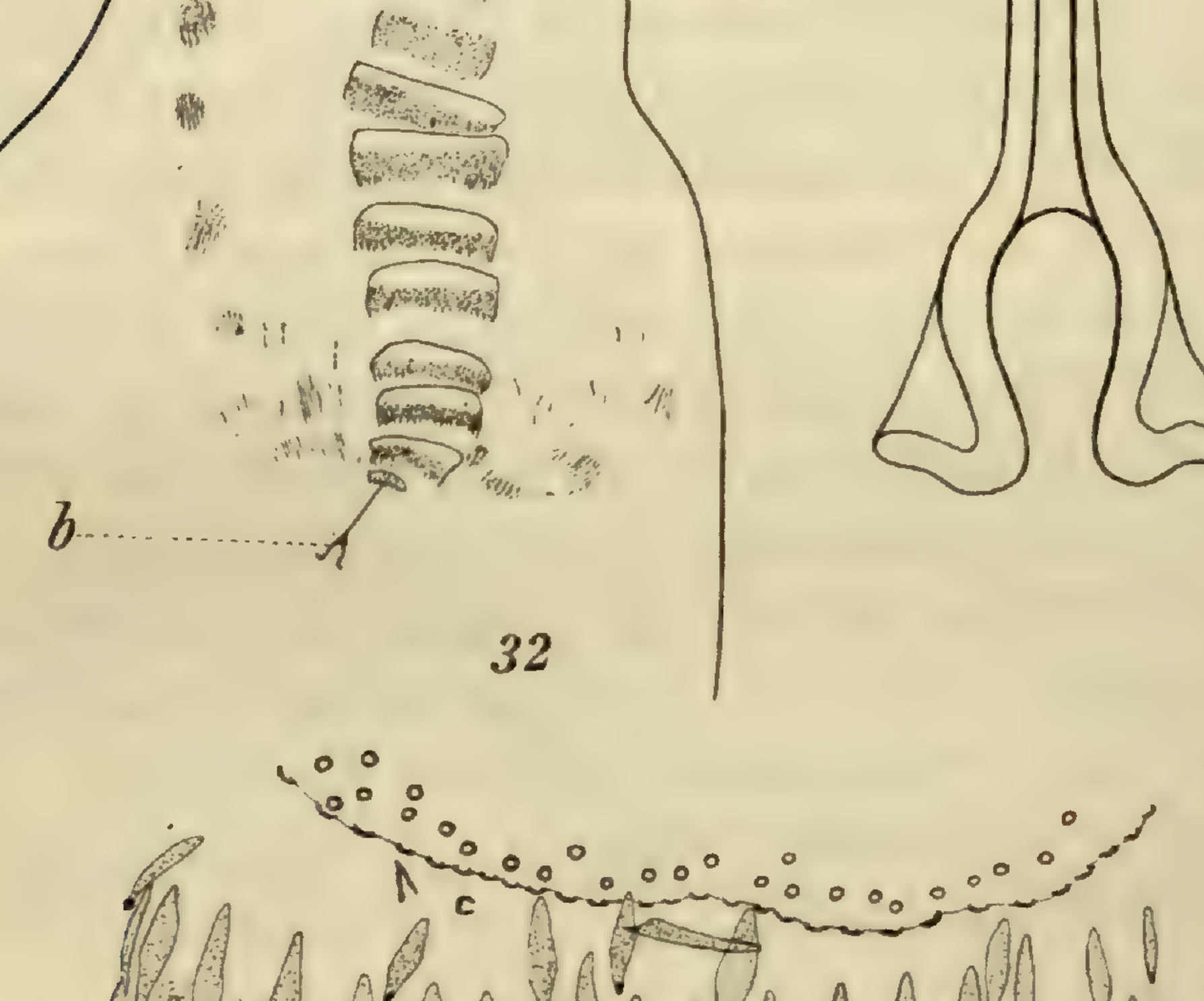

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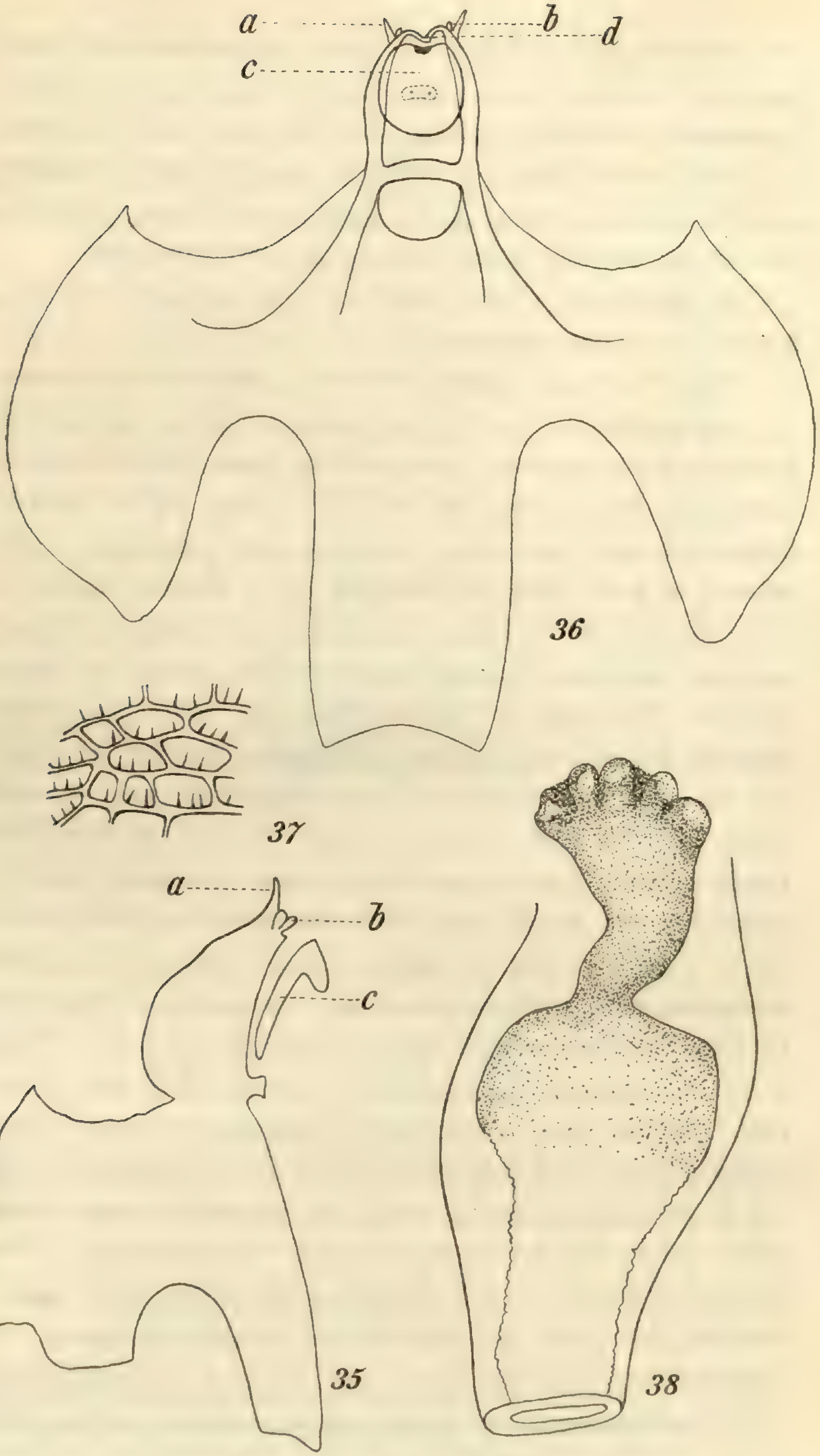
Digonochæta setipennis Fall. Fig. 32. Tragt med Larvehud af en Larve i 1ste Stad. *a*. Hud af Ørentvisten, *b*. Digonochæta-Larvens Svælgskelet. Fig, 33. 1. Stad. Svælgskelet. Fig. 34. Bagranden af den store Plade paa 3. Led, hele 4. Leds Plade og Forranden af 5. Leds Plade.

2det Stadium: Længde c. 3 mm. Huden besat med meget fine, spredt stillede Torne. Svælgskelettet (Fig. 35) af en ganske ejendommelig reduceret Bygning, som jeg hidtil ikke har truffet hos andre Tachin-Larver; da det ikke synes at afvige væsentlig fra 3die Stadium, henviser jeg til Beskrivelsen af dette, af hvilket jeg har haft betydelig bedre Materiale end af 2det Stadium.

Bagspiraklernes atrium cylindrisk, svagt opsvumlet i Spidsen, med to dybt adskilte Knopper.

3die Stadium: Længde 7—9 mm. Huden glat og tornløs.

Svælgskelettet (Fig. 36) lyst, brunligt, Kitinen af en ejendommelig traadet Struktur. Svælgskelettet bestaar fortil af to brede segldannede Plader (Fig. 36), der i den nedre Del er stærkere kitiniserede end i den øvre. Pladerne ender fortil med 3 Udvækster, en øvre, spids og udadrettet og to nedre og kortere, af hvilke den ene ved en Bøjle, der passerer over Svælget, forbindes med den tilsvarende Udvækst paa den anden Halvdel af Svælgskelettet. Ved Roden af Pladerne findes den sædvanlige Forbindelsesbro mellem Svælgskelettets to Halvdele, og bag ved denne Bro udbreder Svælgskelettet sig i de almindelige nedre og øvre Svælgplader, der ikke i Formen afviger fra det sædvanlige hos Tachinlarverne. Under Svælgskelettet findes i Svælgets Bund en Plade (Fig. 36), hvortil intet tilsvarende findes hos andre Tachinlarver; Pladen er bred og dækker omtrent Rummet fra Forbindelsesbøjlen fortil til Forbindelsesbroen. Forranden er tilbagebøjet hos Larven i 2det Stadium i større Udstrækning end i 3die. Pladen er paa Overfladen forsynet med et Netværk af ophøjede Lister (Fig. 37), der bærer meget spidse udadrettede Tænder. Dette Svælgskelet er i høj Grad afvigende fra andre Tachinlarvers, dels ved at Sondringen mellem Mundkroge og forreste og bageste Svælgplader ganske er forsvundet, dels ved Tilstedeværelse af den forreste Forbindelse mellem Spiraklerne og af den store Plade i Svælgets Bund, der vel fungerer som et Slags Siapparat. At Svælgskelettets Reduction skulde være paavirket af Ejendommeligheder hos Værten, er ikke rimeligt, da jeg kender en anden, endnu



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Digonochæta setipennis Fall.

Fig. 35. 2. Stad. Svælgskelet, a. de øverste Tappe paa Svælgskelettets Spids, b. de nederste, c. den store Plade under Svælgskelettet. Fig. 36. 3. Stad. Svælgskelet set fra neden, a, b. c. som i Fig. 35, d. Forbindelsesbøjlen. Fig. 37. En Del af den store Plade. Fig. 38. 3. Stad. Forspirakel.

ikke bestemt, ligeledes i Ørentviste levende Snyltefluelarve, hvis Svælgskelet har Tachinlarvernes almindelige Form [1]).

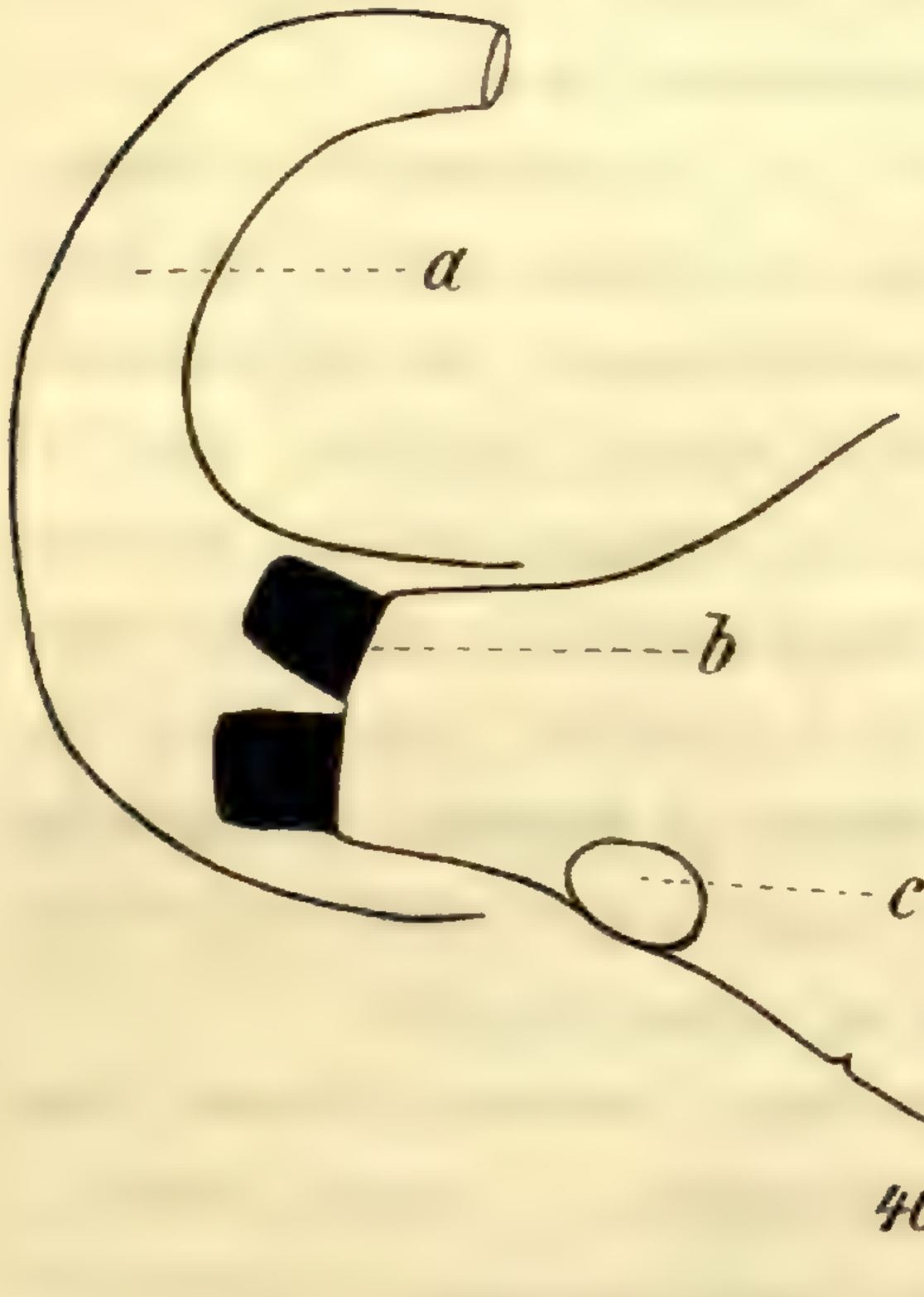
Forspiraklerne (Fig. 38) sidder i en dyb Indsænkning i Huden: Atriet bestaar fortil af et omvendt kegledannet Parti, der løber ud i et varierende Antal (5—8) korte Knopper; det kegledannede Parti fortsættes i et kort og bredt, udvidet, cylindrisk Parti af lysere Farve, der atter fortsættes i et blødhudet Stykke, der naar ned til Indsænkningens Bund. Bagspiraklerne er særdeles fremtrædende. Rammen er udviklet til et cylindrisk, kulsort Rør, der staar ret op fra Huden, og som afflades og omslutter Aandefelterne paa Spidsen; disse er langstrakte, snart svagt bøjede, snart lige, meget varierende i Længde, Form og Antal (Fig. 39).

Tøndepuppen: Længde 4—5 mm. Bredde c. $2^1/_2$ mm. Ægformet-oval, stærkere hvælvet paa Rygsiden — særlig bagtil — end paa Bugsiden. Sort glinsende, Segmentgrænserne kendetegnede ved Rækker af smaa lave Knopper. Forspiraklerne svagt fremstaaende. Bagspiraklerne stærkt fremstaaende som to store, glinsende sorte, ved Roden sammenstødende, divergerende Tappe. Gattet ikke fremstaaende. De ydre Puppespirakler synlige som et Par meget utydelige, smaa Knopper.

Biologi.

Jeg har fundet *Digonochæta setipennis* snyltende i Ørentviste (*Forficula auricularia* L.); den er dog ogsaa her i Landet klækket af en ubestemt Sommerfuglelarve. Jeg antager, at den hos Ørentviste kun lever hos Imagines, idet mindste fandt jeg den ikke

[1]) Jeg kender kun 3die Stadium af denne Larve. Dens Bagspirakel kan ikke adskilles fra *Digonochæta*-Larvernes, men den afviger iøvrigt fra denne i følgende Punkter: Svælgskelettet (Fig. 41) tilhører Tachinlarvernes sædvanlige Type, (dog findes en meget fremtrædende Plade under Mundkrogenes Rod), Forspiraklernes atrium bestaar af et langstrakt cylindrisk Rør, hvis Spids ved Udmundingen i Huden omsluttes af en rund, tagformet Ramme (Fig. 42). Huden er — ialt Fald paa de bageste Leds Rande — besat med Torne. Habituelt kan Larven kendes fra *Digonochæta*-Larven ved, at Bagenden er stærkt tilspidset og stukket længere ind i Tragten (Fig. 40).



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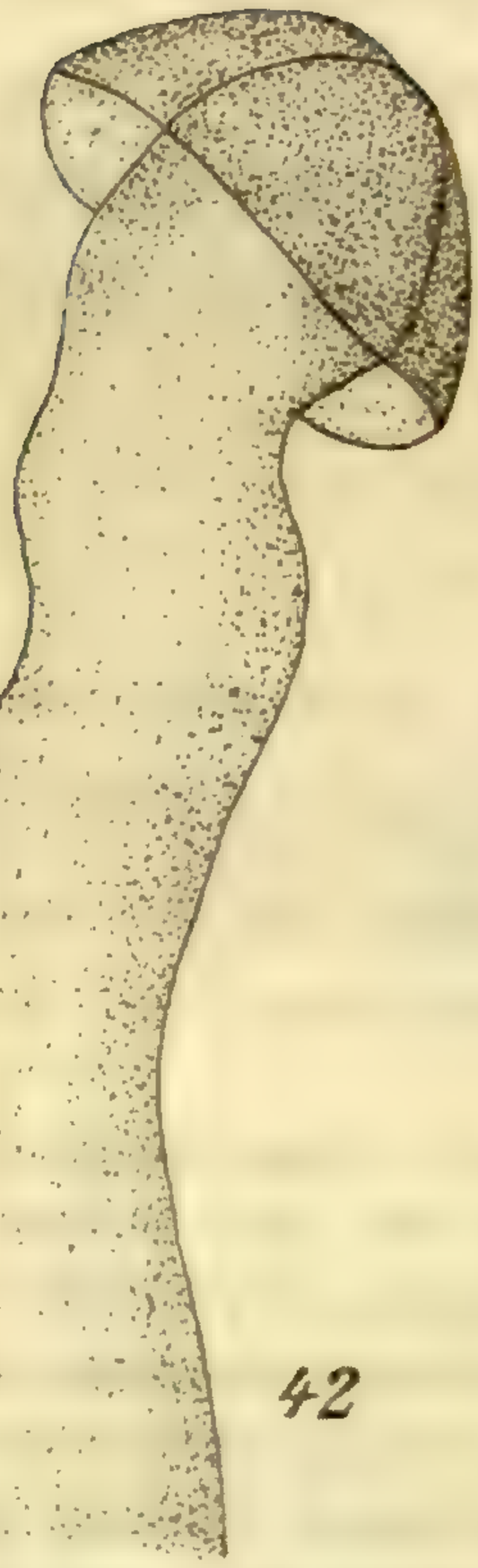

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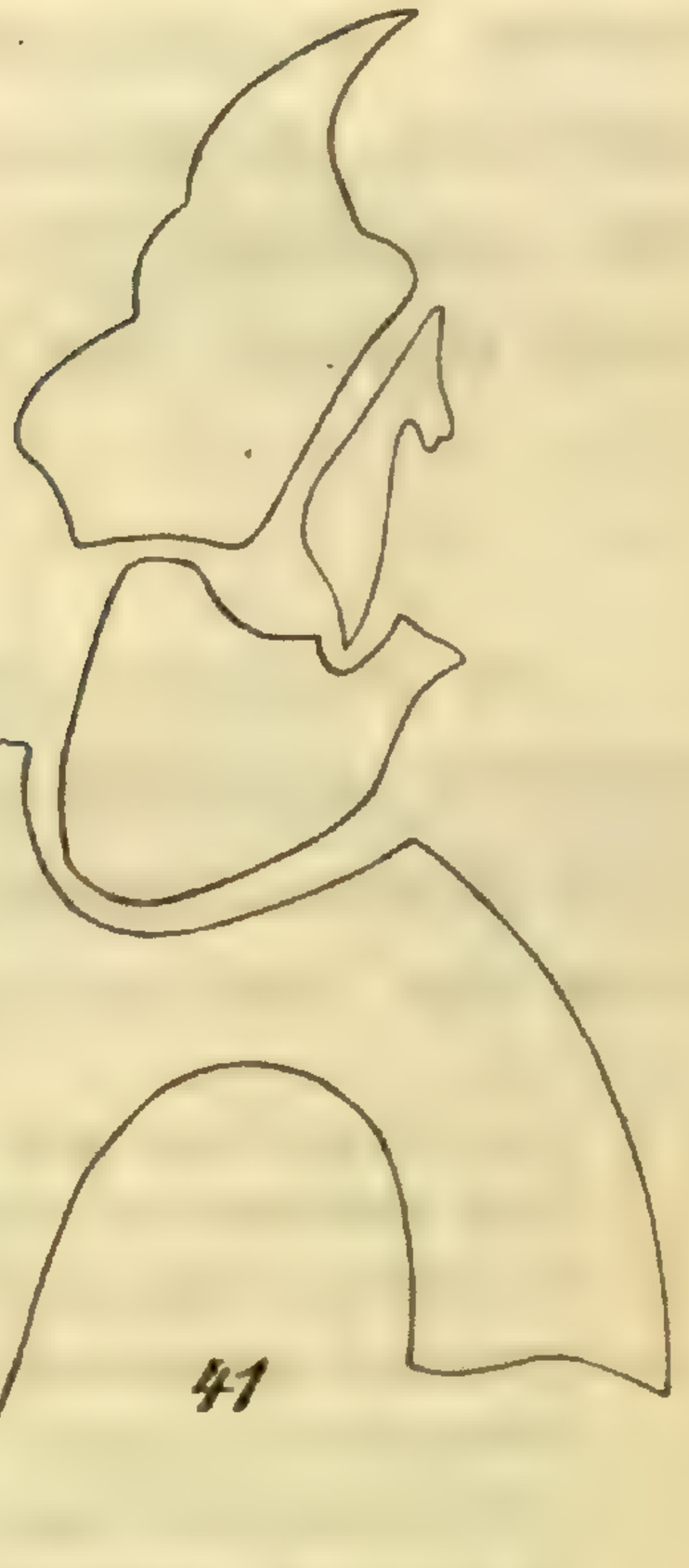

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Digonochæta setipennis Fall. Fig. 39. 3. Stad. Spidsen af et Bagspirakel. *Ubestemt Snylter hos Ørentviste* 3. Stad. Fig. 40. Bagenden af Larven. *a*. Tragten, *b*. Bagspiraklerne, *c*. Anus. Fig. 41. 3. Stad. Svælgskelet. Fig. 42. 3. Stad. Forspirakel.

hos flere hundrede Ørentvistelarver, som jeg i 1910 indsamlede ved Hald paa Steder, hvor tomme Tøndepupper viste, at Snyltefluen var almindelig.

Paa et Sted i Fortunens Indelukke, hvor Lærer P. Kryger gennem flere Aar havde fundet *Digonochæta*-Pupper, indsamledes i September 1909 og i August og September 1912 under løssiddende Bark paa Hegnspæle et Antal *Forficula auricularia* L.; af disse viste ikke faa sig at indeholde Snyltefluers Larver.

Ligesom Pantel har jeg fundet Snylternes Indboringshuller i Ledhuden og altid tæt op til Randen af en Kitinskinne, aldeles overvejende paa Thorax, i et enkelt Tilfælde i Bagkropspidsen, og som den nævnte Forfatter har jeg set 1ste Stadiums Larvehude liggende fuldt udstrakte inde i den fra Indboringshullet udgaaende Tragt; derimod har jeg fundet 2det Stadiums Hud liggende sammenkrøllet inde i den Fedtsæk, der omgiver Larven. Udboringen sker — ialt Fald i Reglen — gennem Ørentvistens Bagkropspids.

Snyltelarverne er fuldvoksne i Oktober; efter Udboringen af Værten forpupper de sig straks paa det Sted, hvor de har forladt Værten, under Bark, i en Larvegang i Træ o. l. Steder. Enkelte Fluer kommer frem samme Efteraar, men de fleste overvintrer som Pupper og udvikles først næste Foraar. Af 5 Pupper, der var fundne i Oktober 1909, kom 1 Flue frem i samme Maaned, de 4 andre udvikledes først d. 12., 13. og 24. April 1910.

Summary

Biological observations.

Phryxe vulgaris Fll.

This species is double-brooded; the maggots of the first generation were found in the caterpillars af *Cheimatobia brumata* L., *Hibernia defoliaria* L. and *Drybota protea* Bhk., those of the

second generation in *Orgyia antiqva* L., *Eremobia ochroleuca* Esp. and *Eupithecia innotata* Hfn. On the skin of the *Drybota protea* Bhk., taken on the $^{9}/_{6}$, were seen little dark spots indicating the way, through which the parasites had penetrated into the caterpillars; few days after ($^{13}/_{6}$—$^{14}/_{6}$) larger spots appeared around some of the spiracles, and by opening the caterpillar I found the *Phryxe*-maggots fixed to the trachea originating from the spiracle. The parasites were full-grown on $^{16}/_{6}$ and the flies emerged the $^{30}/_{6}$. I found no eggs or traces of such on the hosts. The maggots which develop in the *Eupithecia* caterpillars are fullgrown in October, and the puparia hibernate; in these caterpillars was only found a single parasite, in those of *Dryobota* up to four.

Tachina larvarum L.

This and the other *Tachina* species here mentioned have been found parasitic on caterpillars and belong to Pantel's I group.

In the summer af 1911 460 cocoons of *Zygæna filipendulæ* were collected in a little wood in the vicinity of Copenhagen, where this species had occurred in abundance some years ago, but where it is now strongly decreasing in number. From these cocoons 116 *Zygæna* emerged, 225 *T. larvarum* L., 35 Ichneumon flies and 54 were empty. From 1 to 22 eggs were deposited on a single caterpillar, especially on the anterior part of the body. The highest number of Tachinas bred from a single cocoon was 4, thus a great number of the eggs or maggots must have perished during the development. In order to obtain a closer examination of this feature I opened 150 cocoons after the hatching of the Tachinas and counted the number of eggs on the skin of the hosts and the number of puparia lying in the cocoons. The table p. 227 shows the results: From nearly two thirds of the hosts only one parasite was hatched, in spite of the fact that among these hosts were specimens on which up to 16 eggs had been deposited; from a fifth part two flies emerged, from eleven cocoons three and only

from a single host, which bore 13 eggs, four parasites. In addition to these Tachinas also 6 Ichneumon flies were bred from caterpillars with *Tachina*-eggs. In all the 150 caterpillars bore 767 eggs, and the number of bred flies was 144, so that only about a fourth of the parasites succeeded in accomplishing their development. The size of the flies was of course very variable, differing between 5 mm. and 13 mm.; in the cases where several flies emerged from the same host, their size was not equally reduced, one or two of them not differing in size from that of flies which had developed solitary, the remainder being undersized. Allmost all of the maggots pupated within the skin of the dead hosts.

Tachina impotens Rond.

The larva is parasitic in the caterpillars of *Orgyia antiqva* L., which were found on a thorn-hedge in the neighbourhood of Copenhagen. The eggs were deposited only on the fullgrown caterpillars and with few exceptions on the underside of the body, in the furrows between the thoracic segments or between the head and the first segment. The fly was not common, and the caterpillars were nearly all provided with only a single egg each — one only being found with two. Consequent to the maturity of the caterpillars a great number of them pupated before the parasite had penetrated into their body and thus escaped being killed by the maggots; owing to this fact many of them, into which the *Tachina* maggots had penetrated, pupated, before they were killed. Of 34 caterpillars 21 pupated before the *Tachina*-eggs were mature, and 13 after the penetration; of the lastnamed 9 pupated before they were killed and only 4 were killed by the parasites before the pupation. The fullgrown *Tachina*-maggot leaves the remains before pupating and pupates in the hosts cocoon. The infested caterpillars were collected in the months of August—September, and all the flies emerged in October.

Tachina macrocera R. D.

(*T. nitidiventris* Zett.).

This fly has been bred from caterpillars of *Dasychira groenlandica* Woche in East Greenland. In Denmark I have meet with the species in June at Tisvilde, where it oviposited on fullgrown caterpillars of *Malacosoma castrensis* L.; all the hosts pupated before they were killed by the parasites, which pupated in the cocoon outside the pupal shell of the hosts.

Tachina vidua Meig.

Bred from a caterpillar of *Macrothylacia rubi* L.

Digonochæta setipennis Fall.

Bred from an undetermined caterpillar and in numbers from fullgrown earwigs (*Forficula auricularia* L.). In September the maggots are in the 3rd stage and are found with the posterior end attached to a chitinous funnel originating from a hole in the skin between the sclerites, through which the young larva has penetrated into the earwig. The hole is in most cases found on the thorax of the earwig. In the funnel the cast larval skin of the first stage of the *Digonochæta* larva is lying fully extended. Before the pupation the parasite leaves the host. The maggots are fullgrown in October and the flies emerge either in the same autumn or in April of the next year.

Explanation of the figures.

Phryxe vulgaris Fll.

Fig. 1. 1. Stage. Pharyngeal skeleton.
— 2. 2. — — —
— 3. 3. — Anterior spiracle.
— 4. - — Pharyngeal skeleton.
— 5. - — Anterior spiracle.
— 6. - — Posterior spiracles.

Fig. 7. Skin of a larva of *Drybota protea*, with a hole (*a*) through which the *Phryxe*-larva has penetrated, and spiracles (*b*) surrounded with dark marks indicating that the *Drybota*-larva is infested with *Phryxe vulgaris*.

Tachina larvarum L.

Fig. 8. Egg. a appendix.
— 9. 1. Stage. Posterior end. a chitinous sticks.
— 10. — Skin from the 12. Segment with spines and two sticks.
— 11. — Pharyngeal skeleton.
— 12. — Apex of the pharyngeal skeleton.
— 13. 2. — Pharyngeal skeleton.
— 14. 3. — — —
— 15. — Anterior spiracle.
— 16. — The end of an anterior spiracle, sideview.
— 17. — Posterior spiracle.
— 18. Puparium. Posterior spiracles and anal papilla.

Tachina impotens Rond.

Fig. 19. 1. Stage. Posterior end.
— 20. — Pharyngeal skeleton.
— 21. 2. — — —
— 22. 3. — — —
— 23. — Anterior spiracle.
— 24. — Posterior spiracle.

Tachina macrocera Rob. Dew.

Fig. 25. 1. Stage. Pharyngeal skeleton.
— 26. 2. — — —
— 27. 3. — — —
— 28. — Anterior spiracle.
— 29. — Posterior spiracle.
— 30. Puparium. Posterior spiracles and anal papilla.

Tachina vidua Meig.

Fig. 31. 3. Stage. Posterior spiracle.

Digonochæta setipennis Fll.

Fig. 32. Funnel, originating from the skin of an earwig, with the cast larval skin of a *Digonochæta*-larva in 1. stage. *a*. a part of the skin of the earwig. *b*. pharyngeal skeleton of the *Digonochæta*-larva.

Fig. 33. 1. Stage. Pharyngeal skeleton.
— 34. — A part of the skin.
— 35. 2. — Pharyngeal skeleton. *a*. the upper tooth, *b*. the lower tooth of the apex of the skeleton, *c*. a great plate under the skeleton.
— 36. 3. Stage. Pharyngeal skeleton, from the underside: *a*. *b*. *c*. as in fig. 35, *d*. the connection between the ends of the plates.
— 37. 3. stage. A part of the plates under the pharyngeal skeleton.
— 38. — Anterior spiracle.
— 39. — End of a posterior spiracle.

Undetermined larva in earwigs.

Fig. 40. 3. Stage. Posterior end lying in the funnel (*a*). *b*. posterior spiracles. *c*. anus.
— 41. — Pharyngeal skeleton.
— 42. — Anterior spiracle.

10.—11.—1912.

Systematic Studies on the Sertulariidae.

By

G. M. R. Levinsen.

(With Plates IV—V).

In 1893 I published a paper on the Medusae, Ctenophores and Hydroids from the west-coast of Greenland, in which I made an attempt to introduce a more natural arrangement of certain families of Hydroids, advocating the view, that in the limitation of the genera the characters found in the single individuals of the colony, and especially in the trophosomes, ought to be preferred to such characters, which might be derived from their different arrangement on the stems and branches of the colony. As to the *Sertulariidae* I proposed a limitation of the genera on the basis of the diversities presented by the opercular apparatus, and by the margin of the hydrotheca, the form of which is always contingent upon the structure of the operculum. While a number of authors (Marktanner-Turneretscher, Schydlowsky, Broch, Sæmundsson and Kramp) have followed my view, it has been attacked by others, but before I undertake to answer the objections raised against it, I shall set forth some general remarks on the systematic value of the colonial form or the form of growth.

In all aggregate animals we have to discern between two categories of characters of very different systematic value, namely those presented by the single individuals (the zooidal ch.) and those derived from the different ways in which they may be arranged in the colony (the zoarial or colonial ch.). In the first attempts at a systematic arrangement of aggregate animals the latter characters

have of course always been the first used by the authors, who at that point of time had only a very imperfect knowledge of the single individuals composing the colony or none at all. The pictures presented by the different colonial forms captivated the eye, and through this mastered the arranging thought. Such an attempt is Ellis' renowned work on the Corallines[1]) under which common name he classes not only Hydroid polyps and *Bryozoa*, but also the articulate chalk-algae, while the first step to dissolve the systematic connection between the two first named divisions was made in 1828 by Milne-Edwards and Audouin[2]) who pointed out that *Flustra* in opposition to the polyps possesses an intestinal tube provided with two apertures, and in consequence of this discovery proposed the institution of a separate family comprising the *Flustrae* and relied forms. But the belief in the systematic importance of the outer habitus and the mode of growth is not so easily conquered, and ten years later Milne-Edwards[3]) says about the result of this proposal: „Ce premier essai d'une classification naturelle des Polypes fondée sur l'organisation de ces animaux ne fut pas adopté par les zoologistes. M. Cuvier, dans la seconde édition du règne animal, publiée en 1830, continua à distribuer ces zoophytes d'apres la conformation générale de leur Polypier et rangea encore les Flustres entre les Sertulaires et les Corallines tandis que les Eschares dont la structure diffère à peine de celle de ces Flustres se trouvaient relegués dans la tribu des Lithophytes à la suite des Coraux et des Madrépores." After Milne-Edwards had extended his investigations also into the anatomy of the strongly calcified cheilostomatous forms (the *Escharae*), and other naturalists as delle Chiaje, Ehrenberg and Lister had arrived at the same results, the *Bryozoa* were gradually separated from the Hydroid polypes, but still in the second edition of Lamarck's Histoire naturelle des animaux sans vertèbres (1836)

[1]) 18.
[2]) 6, p. 14.
[3]) 41, p. 16.

we find for inst. *Thujaria thuja* and *Thuj. lonchitis* referred to the genus *Cellaria* and placed between *Cellaria (Crisia) eburnea* and *Cell. (Bicellariella) ciliata.*

While the older Bryozoan systems are based entirely on diversities in the form of the colony Smitt and Hincks lay the chief stress on the form and structure of the zooids, and this view must at present be regarded as the dominant. As, however, in the Hydroids most authors as systematic characters still prefer zoarial diversities to zooidal, I think it might be of use in general to examine the question how great systematic importance may be ascribed to the form of the colony, and I shall first give some quotations from the few authors who have treated this question with respect to the *Bryozoa*. The first quotation is from the late Th. Hincks[1]) who has played a chief part in the working out of a more natural Bryozoan system, and has, besides, done such excellent work also in the Hydroid polyps. After having spoken about the slight help, which the polypide, and the avicularia give us in systematic regard, he continues: "There remain the characters of the cell[2]) itself and the habit of growth. It can hardly be deemed doubtful which of them should have the precedence in a natural system; we may go very much further, indeed, and say that in such a system the latter must hold a very secondary and subordinate place. The essential structure of the cell[2]), as one of the primary zooidal[3]) forms. must certainly be accounted the most important point both in itself and as a clue to relationship. The mere habit is, so to speak, a superinduced condition, which may be different in the most nearly related and similar in the most divergent forms, and groups based on it,

[1]) 23, Introd., p. CXXVIII.

[2]) By the "cell" is here meant the zooecium.

[3]) According to the old cystid theory the zooecium and the nutritive apparatus (the polypide) were both regarded as individuals (zooids). The above citation from Hincks has also been used in my work on the cheilostomatous bryozoa (35, p. 68), but by a mistake the word "zooidal" has been replaced by "zooecial".

instead of fitting in with natural affinities, are found to traverse them at all points." In 1884 the late G. Busk[1]) who has rendered so great services to the study of the *Bryozoa*, published his report on the cheilostomatous *Bryozoa* from the Challenger expedition. The author, who had hitherto laid the chief stress on the colonial characters, strives to a certain degree to accomodate himself to the systematic views of Smitt and Hincks, the correctness of which he partially acknowledges, but he thinks, however, that these authors have underestimated the colonial characters. The result of this mediation is, as he himself acknowledges, far from being satisfactory. I shall here quote the following part of his introduction: "As to the scheme of classification followed in this Report, ... it is scarcely necessary to remark that it has no pretension to be regarded as more than a convenient and to a considerable degree artificial arrangement, ... For allthough many of the family groups may in some measure be regarded as expressing natural alliances, many of them, ... can only be considered as artificial, and as such they must perhaps remain until we are better acquainted with the true significance of the minute parts or organs upon which the distinctive characters are in many cases founded. Nor at present, perhaps, are we in a position fully to appreciate the relative value of the zooecial as compared with the zooarial characters, which of late it appears to be the fashion, unduly as I think, to depreciate; the individuality of the zoarium as a continuous whole or entity having been too much overlooked in the almost exclusive consideration of its component parts or segments."

A somewhat similar standpoint has been taken up by Rev. A. M. Norman[2]), who has published a number of valuable papers on the *Bryozoa*. He expresses himself as follows: "It has been argued by recent writers that the form which a colony of a polyzoon belonging to the *Cheilostomata* assumes is of no moment in generic

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[1]) 14 a.

[2]) 43, p. 122.

character. *Electra pilosa* lends strong support to this view. Yet it is a view nevertheless in which I am not prepared in all cases to acquiesce. The zooecial characters are unquestionably all important, but no lasting classification can be based on any part of the zooecium . . . . . Why also in all instances is the ultimate growth and form of the zoarium to be excluded from generic character among certain families of the *Cheilostomata*, and at the same time to be recognized among the *Cyclostomata* and *Ctenostomata*, and even other groups of the *Cheilostomata*? This is surely scarcely consistent. In some instances, as for example in *Electra pilosa*, the form of the colony is of no generic and specific value, but in other cases it may be and, I believe, is."

In the systematic arrangement of most families of Hydroids the chief stress has not as in the earlier Bryozoan system been laid on the colonial form, but partly on the structure of the zooids partly on the different mode of reproduction, and the differences of opinion have arisen mostly from the question how great systematic importance ought to be ascribed to the latter. The reason hereof is partly, that the zooids which are much larger and therefore much easier to examine than those of the *Bryozoa*, present a number of easily recognisable characters, f. inst. in the different form and arrangement of their tentacles, and in the different form of their proboscis and hydrothecae, partly, that the colonial form in most families does not present such differences which might tempt a systematist to the institution of genera. Such are on the contrary to be found in the *Sertulariidae*, in which the mode of arrangement of the hydrothecae together with the mode of branchiug is subject to very great variation, and, therefore, to a great extent has been used by the systematists. As soon as the operculum was detected and used as a systematic character there began a discussion about its systematic significance which still continues.

The first author who recognizes the systematic importance of this structure was Hincks[1]). While Grey had characterized

[1]) 22.

Sertularella by the strictly alternate position of its hydrothecae, Hincks lays the chief stress on the structure of the latter which are provided with 3—4 marginal teeth and with a similar number of opercular valves. While he has found no operculum in *Sertularia* and *Hydrallmania*, and in one of the two *Thujaria*-species named in his work, he characterizes *Diphasia* by the presence of an inner (adcauline) operculum, but as he has not seen that a quite similar operculum is also present in *Abietinaria abietina* and *Ab. filicula* he refers them to *Sertularia*. In the diagnosis of the different genera the author also uses the form of the colony and the structure of the gonothecae, but he expressly emphasizes that the whole arrangement must only be regarded as provisional:[1]) "Without the examination of a much larger number of foreign species, the genera of this family cannot be defined with certainty and precision; and the present grouping must be accepted as to some extent, provisional".

Professor G. J. Allman, who has published so many valuable works on the Hydroids, in opposition to Hincks has great confidence in the systematic importance of the colonial characters, and in one of his papers[2]) he even institutes a new family *Thujariidae*, solely based on the mode of division of the hydrocaulus into internodes. In his report on the Hydroids from the Challenger expedition he unites *Sertularella* with *Sertularia* as he has found an operculum in some species of the latter genus, and evidently cannot imagine that a generic difference might be expressed through the different form and position of something so delicate and perishable as the operculum, about the systematic significance of which he says[3]): "The valves in all these cases are so thin and perishable that it is only in recent or exceptionally well preserved specimens we can hope to meet with them, a fact which in itself deprives the distinctions, derived from them of that practical value

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[1]) 22, pag. 260.
[2]) 2, pag. 267.
[3]) 5, pag. 51.

which ought if possible to be found in all well-selected systematic characters."

In my paper on the Greenland Hydroids I say about the colonial characters [1]): "A zoological system based on that kind of characters may be compared to a botanical in which the chief stress was laid on the inflorescences and not on the structure of the flowers. In both cases the genus would contain a number of heterogeneous species. It can hardly be deemed doubtful, that constant differences in the structure of the single individuals, in question of the hydrothecae or hydranths, ought to be preferred as systematic characters, and that colonial characters ought only to be used when structural diversities were not to be found."

When we compare the two categories of characters, the colonial and the zooidal, with respect to the question, which of them give us the most valuable information about the beings concerned, there can be no doubt that it is the latter which do so, as they inform us both about the structure of these beings and about the different modifications which this structure may present. The colonial characters only inform us of the form of the colony, and the different arrangement of the zooids, and in opposition to the combination of characters upon which the systematic position of the species is contingent the arrangement of the zooids may often be quite the same in species belonging to different classes. In the Bryozoan species *Gemellaria loricata* for inst. the colony as in many *Sertularia*-species is composed of pairs of zooids, each of which by a constriction is divided from the next one. If the colonial characters might be regarded as a true, though imperfect, expression of the natural affinity, it could only be on the supposition, that there always existed so close a relation between structure and colonial form that differences in the latter not only corresponded to a difference in class, but also to differences of order, family and genus. Everybody knows that this is not the case. In the vegetable kingdom we may at the one

[1]) 32, pag. 184.

side find the same form of inflorescence in different classes, ordines etc., and at the other side different inflorescences in the same family or even genus. In the *Bryozoa* we find the same unstable relation between structure and colonial form, and a great number of species may even appear in two or more different modes of growth, and with different arrangement of the zooecia. The most interesting example we possess is *Membranipora (Electra) pilosa* L. which according to A. M. Norman[1]) appears in the Trondhjem Fjord in 10 different modes of growth, a number of which were earlier regarded as the chief character of certain genera. The author says about these forms: "We see enormous changes brought about apparently at the will of individuals, who, building colonies after the various fashions characteristic of a large number of genera ..... simulate the general forms of a *Membranipora*, a *Hippothoa*, a *Carbasea*, a *Flustra*, a *Cellaria*, a *Gemellaria* and an *Eucratea*. Numerous other examples are named in my work on the Cheilostomatous Bryozoa[2]).

As to the Hydroids there is no reason to believe that the arrangement of the zooids should in this division be a more true expression of the natural affinity than in the *Bryozoa*. I shall at this place only bring forward as an example the artificial genus *Selaginopsis* (Allman) Mereschkowsky, as Schneider[3]) regards it as one of the best defined genera in the family *Sertulariidae*. Nutting[4]) has given a new definition of it, according to which it only contains species of the genera *Thujaria* and *Sertularia*, but he does not mention where he will put the polyserial species of the genus *Diphasia*. According to the original definition of

[1]) 43, p. .
[2]) 35, p. 70.
[3]) „Deutlich sich aus diesem Chaos abhebend standen nur *Pasythea* ... und *Hydrallmania* ..... Auch *Selaginopsis* Allman kann wegen vielreihiger Anordnung der Hydrotheken an der einzelnen Sympodien nicht zweifelhaft gestellt erscheinen, obgleich Levinsen sie auf drei seiner Gattungen, *Sertularia*, *Thujaria* und *Diphasia* auftheilt (54. p. 521).
[4]) 44, p. 127.

the genus, which is followed by most authors, *Selaginopsis* is only based on the character, that the hydrothecae are arranged in more than two longitudinal series, and if an author were to institute a new genus for inst. for those species of the bryozoan genus *Caberea*, in which the zooecia present a similar arrangement, it would certainly be rejected as based on too feeble a foundation, but it would nevertheless possess this advantage over *Selaginopsis*, that its species would agree in all essential respects. Most species of the latter "genus" belong to *Thujaria*, but three must be referred to *Sertularia*, namely *Sel. mirabilis* Verr. (= *Sel. Hincksi* Mer.), *Sel. ochotensis* Mer. and *Sel. (Pericladum) bidentata* (Allm.)[1]), and two to *Diphasia*, namely *D. fusca* (Johnst.) (= *Thujaria salicornia* Allm.) and *D. Wandeli* Lev. Perhaps the same is the case with *Sel. Allmani* Norman[2]) (= *Sel. fusca* Allm.) Also *Sertularella* is represented within *Selaginopsis*, namely by *Sert. (Dictyocladium) flabellum* Nutt. and *Sert. (Dictyocladium) reticulatum* Krp., which both satisfy the claims put upon the species of this "genus", their hydrothecae being arranged in four longitudinal series, but they have by Allman[3]) been placed into another artificial genus, *Dictyocladium*, which differs from *Selaginopsis* therein that the branches are anastomosing. While the hydrothecae of all the species hitherto named are provided with opercula, no opercula are present in a number of other polyserial species, three of which have been referred to *Dictyocladium*, namely *D. dichotomum* Allm., *D. (Selaginopsis* Jäd.*) affine* (Jäd.[4]) and *D.* (*Selaginopsis* Jäd.) *dichotomum* (Jäd.[5]), and the same is the case with *Selaginopsis pachyclada* Jäd.[6]) and with a number of species referred to the artificial genus *Staurotheca* Allm. Allman[3]) characterized the latter genus by the possession of opposite hydrothecae which are arranged in

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[1]) 2, p. 273.
[2]) 42.
[3]) 5.
[4]) 27 a, p. 32 and 59, p. 331.
[5]) 26 a, and 59, p. 332.
[6]) 27 a, p. 33.

decussating pairs, but Ritchie[1]) has enlarged it to also include species with more than four longitudinal series of hydrothecae, characterizing it by the arrangement of the hydrothecae in alternate transverse series, each containing two or three hydrothecae; but a somewhat similar arrangement is also found in a number of *Selaginopsis*-species and according to Broch[2]) we not rarely find in *Sel. mirabilis* four longitudinal series of hydrothecae in the place of six, and in that case the hydrothecae are, as in *Stauro-theca dichotoma*, arranged in decussating pairs.

Even if all the species referred to *Selaginopsis* possessed a special form of operculum not found in any other genus, I should only regard the polyserial arrangement of the hydrothecae as a systematic character of lower rank, but it is evident from the above enumeration of species that there is not the slightest connection between this arrangement and the form of the operculum, and the former is as a rule not even constant within the colony, as in most species the hydrothecae are biserial in the stem, and besides, there has been found a number of species belonging to *Diphasia*, *Thujaria* and *Sertularia*, which present both biserial and triserial hydrothecae either in the same or in different branches, and sometimes in different colonies. *Diphasia Wandeli*, in the original specimen of which all the branches have three series of hydrothecae, is nearly related to *D. fallax*, and is perhaps only to be regarded as a variety of the latter species. Sæmundsson[3]) refers to *D. Wandeli* four colonies, three of which have only biserial hydrothecae while in the fourth, which possesses 17 pairs of branches, two at the one side and six at the other have only biserial hydrothecae in their proximal portion and triserial in the rest of their length. Broch[4]) has described a *Thujaria*, to which he has given no name as he is not sure of its identity. In the

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[1]) 50, p. 538.
[2]) 13, p. 173.
[3]) 56, p. 97.
[4]) 13, p. 177.

proximal part of all the branches the hydrothecae are arranged in three longitudinal series, and in one of them this arrangement is continued through its whole length while in the others the rest of the hydrothecae are biserial. In another *Thujaria*-species, described by Torrey[1]) under the name of *Sertularia incongrua* the branches in their proximal portion possess two series of hydrothecae, and usually three series in their distal half. Nutting refers this species to *Selaginopsis triserialis* Mer.; but according to Mereschkowsky the triserial arrangement of the hydrothecae is in the latter species constant through the whole colony. Lastly I shall mention that Bale[2]) in a variety of *Sertularia unguiculata* Busk has found in some of the pinnae "a third series of hydrothecae, running for some distance along the front of the first internode."

The fact that there is no constant relation between the structure of the zooids and the colonial form, or to express it in another way, that they are incommensurable values defined by different laws, must have the logical sequence that one of them cannot be substituted for the other, and, therefore, a genus ought never to be instituted solely on the base of a difference in the colonial form, when otherwise the zooids present distinct structural diversities. When that is not the case, as in the great plurality of the cyclostomatous *Bryozoa*, we have of course only the colonial form to rely upon. To regard the colonial characters as the true generic characters and the zooidal characters only as specific characters, as some authors have done, is to turn the systematic arrangement upside down. —

In 1897 Dr. C. Schneider[3]) published a paper on the Hydroid polyps from Rovigno[3]), in which, besides, he sets forth a number of systematic remarks, of which we shall here only mention those referring to the *Sertulariidae*. I may give here

[1]) 57, p. 69.
[2]) 7, p. 76.
[3]) 54.

a critical representation of his Sertularian system, and in order to make it more coherent and easier to read, I shall give most of the quotations, on which it is based, as notes. Schneider at first states [1]) that my system, which is based on diversities in the opercular apparatus, cannot in any way stand together with that of the former authors who divide the genera mainly according to the arrangement of the hydrothecae in the branches [2]). He admits that at first sight it looks seductive [3]), but though he does not seem to have subjected it to a real test, he comes to the result that the older authors are right in the main, and that such a great systematic importance cannot be ascribed to the operculum in opposition to the characters formerly used [4]). — Schneider gives three reasons why he has not been able to admit my systematic characters. The first is connected with my assertion that there exists a certain harmony between the margin of the hydrotheca and the structure of the operculum, and that we, therefore, even in colonies which have lost their opercula, may be able from the structure of the former to draw a conclusion as to the character of the latter. Schneider thinks it possible, therefore, that a great deal of my statements are only based on this form of investigation [5]), in which he evidently has no confidence. However, I

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[1]) „Levinsen begründet auf den Bau des Opercularapparats seine von der ältern durchaus abweichende Systematik. Es ist nothwendig, zu dieser sofort Stellung zu nehmen; denn, falls wir sie acceptiren müssen ist eine Besprechung der frühern systematischen Angaben überflüssig ja unmöglich“ (p. 520).

[2]) „Die ältere Systematik hielt sich, wenigstens in der Hauptsache, an die Vertheilung der Hydrotheken an den Sympodien“ (p. 521).

[3]) „Für den ersten Blick hat diese Eintheilung etwas Bestechendes“ (p. 521).

[4]) „Indessen fragt es sich, ob wir der Deckelbeschaffenheit so hohe Bedeutung gegenüber den bis jetzt angenommenen Charakteren zuschreiben dürfen und ob letztere nicht doch wenigstens in den Hauptzügen zu Recht bestanden. Ich glaube nun, mich dieser letzteren Anschauung zuneigen zu müssen“ (p. 520).

[5]) „Ueberhaupt mag Levinsen in den Auftheilungen wohl oft zu sehr der äusseren Beschaffenheit der Hydrothekenmündung, die meist doch nicht immer auf eine bestimmte Deckelbeschaffenheit schliessen lässt, Rechnung getragen haben“ (p. 522).

have not used it for any of the species treated of in my paper. Schneider's second reason is due to a misunderstandig, as he namely has got the impression, that I regard the operculum of *Sertularia* as an internal structure placed under the original roof of the hydrotheca, and he cannot understand such an operculum [1]), in which I quite agree with him. I cannot, however, understand in what manner Schneider has got this impression. He declares [2]) that he only knows my investigations from the partial translation which has been given by Markthanner-Turneretscher [3]), but in this the position of the operculum in *Sertularia* is mentioned in the following way: „Die Mündung der Hydrothek ist an der abcaulinen Seite mit einer tiefen Einbuchtung versehen, in welcher das Deckel befestigt ist", and in my paper I say quite the same in Danish as well as in Latin. After having set forth the last named objection Schneider says: „Diese Bedenken lassen mich vor der Hand davon absehen, Levinsen's Gattungskaraktere als gute anzuerkennen" after which he adds: „Damit sei ihnen indessen nicht jeder Werth überhaupt bestritten." Schneider does not explain what he means by this sentence, but it seems permissible to understand his words as meaning, that the characters named may be used as species-characters.

I think that the chief reason for Schneider's different systematic standpoint from mine must be sought for in our different mode of working. While I have endeavoured to divide the genera as strictly as possible, deferring the question as to their mutual relation, till a sufficient amount of knowledge has been secured, Schneider's chief aim has been to unite and to find — as fast as possible — the unity in the multiplicity. Therefore he does not like strictly defined genera which apparently protest against this unity, and, besides, he has no time to wait, until the great bulk of the hitherto described species have been examined as to

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[1]) „Auf Grund dieser Erwägungen kann eigentlich von einem inneren Deckel nicht geredet werden" (p. 522).
[2]) 54, p. 511.
[3]) 37.

their opercula. The colonial form, in the systematic importance of which he implicitely believes, gives him in much shorter time a general view of the connection between all these forms, showing him that the different "groups" are mutually united by transitional forms, and that sharp contrasts do not exist at all. The following statement, however, seems to show that Schneider uses the term "transition" in a very singular manner[1]): „*Thujaria*, *Selaginopsis* and *Pasythea* sind durch Uebergänge vermittelt, wie schon daraus klar wird, dass Levinsen Vertreter jeder dieser drei Gruppen auf mehrere seiner Gattungen vertheilt." I cannot see the clearness of this argument. When I have shown that the species of the old genus *Selaginopsis* according to their opercular apparatus must be distributed into the genera *Thujaria*, *Sertularia* and *Diphasia*, and that other species provided with the same forms of opercula are contained within the frame of the old genus *Sertularia*, this fact does not prove, that *Selaginopsis* and *Sertularia* are connected by transitions, but only that they are artificial genera. On the other hand there are numerous transitions between the different colonial forms which have been used as generic characters, and Schneider, therefore, quite naturally comes to the result that all the *Sertulariidae* strictly speaking must be regarded as forming a single genus[1]). This he again divides into groups admitting at the same time that neither are they strictly divided. We shall later consider some of these groups. —.

While Schneider originally declared that my opercular system was quite inconsistent with one based on the arrangement of the hydrothecae, he at other places sets forth quite contrary statements, according to which we should believe, that there is the most complete agreement between the colonial form and the structure of the operculum. Thus he says[2]). „Aber wenn wir die typischsten Formen der *Sertularidae* ansehen, scheint Hand in Hand mit besondern Deckelformen auch eine besondere Anordnung

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[1]) 54, p. 522.
[2]) 54, p. 522.

der Theken zu gehen. Ein kleiner Ueberblick soll dass erweisen." Further he says[1]): „Aber ein Ueberblick über die ganze Gruppe lehrt den innigsten Zusammenhang aller oft anscheinend so heterogenen Formen unter einander; von einer Gruppe zur andern vermitteln Zwischenglieder, und diese Zwischenformen vermitteln auch hinsichtlich der Form und Anheftungsweise der Deckel." However, Schneider's apparently contradictory assertions might perhaps be explained in this way, that he has found my statements regarding the structure of the different opercula incorrect, and therefore has undertaken a new investigation with another result. He says that the large collection of Hydroids in the zoological museum of Vienna, which have been identified by Marktanner-Turneretscher has been at his disposal, and there might be reason to believe that by the aid of this collection he had tested the correctness of my investigation. But he does not seem to have done such a thing, and the above assertion is directly contradicted not only by my investigations, but also by the contents of his own groups.

The central point in Schneider's system is that he regards *Sertularella* as the genus from which all the other genera have developed, but he makes no attempt to solve that question which in this connection should be the most important, namely, in what manner the different forms of opercula might have been developed from the operculum of *Sertularella*. Driesch[2]) in the *Sertulariidae* discerns between two chief colonial types, the *Diphasia*-type with opposite and the *Sertularella*-type with alternate hydrothecae, and he has tried to show that the former type may be derived from the latter. From this starting point Schneider[3]) gives the following sketch of the development of the different „groups" from *Sertularella* by means of a moving together of the hydrothecae: „Es verschwinden zunächst eine Anzahl Gelenke aus Ursache der

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[1]) 54, p. 521.
[2]) 17.
[3]) 54, p. 524.

grössern Annäherung der Hydranthen; das ergiebt den *Thujaria*- und den *Dynamena*-Typus, letzterer vielleicht zum Theil direct aus dem *Sertularella*-, zum Theil aus dem *Thujaria*-Typus ableitbar. Noch grössere Annäherung führt zur Entwicklung der *Pasythea*-Gruppe, zum Theil von *Thujaria*, zum Theil von *Dynamena* aus; ferner zur *Selaginopsis*- und zur *Hydrallmania*-Gruppe, beide von *Thujaria* aus." When Schneider lets the joints disappear in order to produce the *Dynamena*-type, he forgets that according to his own definition of this type it is characterized by the possession of a joint between each two pairs of hydrothecae.

Of the six groups into which Schneider divides the *Sertulariidae* we have already regarded *Selaginopsis*, and we shall later speak about *Pasythea* and *Hydrallmania* on mentioning the systematic arrangement proposed by Professor Nutting. At this place, therefore, we have only to mention the groups *Dynamena* and *Thujaria*.

Schneider characterizes the *Dynamena*-group in the following way: „Die Hydrotheken opponirt, zwischen jedem Paar ein Gelenk; .....; Mündung der Theca meist mit zwei vorgetäuschten (Levinsen) Zähnen, Deckel einfach. — Hierher gehören: *Diphasia rosacea* L., *attenuata* Hincks, *fallax* Johnston, *pinaster* Ell. et Sol., *tamarisca* L., *pinnata* Pallas., *Sertularia pumila* L., *gracilis* Hassall, *operculata* L.; *Sertularia bispinosa* Gray, *minima* Thompson, *macrocarpa* Bale." Of the species here named *Diphasia rosacea*, *D. attenuata*, *D. fallax*, *D. pinaster* and *D. pinnata* have no teeth and an adcauline opercular valve and belong to my genus *Diphasia*, while *D. tamarisca* must be referred to *Sertularella* as it possesses a tridentate hydrotheca and three opercular valves. *Sertularia pumila*, *S. gracilis* and *S. minima* belong to my genus *Sertularia*, as the bidentate hydrothecae possess an adcauline collar and an abcauline opercular valve, while *Sertularia opercularis*, *S. bispinosa* and *S. macrocarpa* must be referred to a new genus, *Odontotheca*.

The *Thujaria*-group is characterized as follows: „Die Hydrotheken mehr oder weniger alternirend, oft fast opponiert gestellt, dicht benachbart und mehrere bis viele auf ein Internodium gehäuft; .....; Mündung der Theca meist glatt, Deckel einfach. — Hierher gehören: *Diphasia alata* Hincks, *Sertularia filicula* Ell. et Sol., *abietina* L., *argentea* Ell. et Sol., *cupressina* L., *Thujaria thuja* u. *lonchitis*; *Sertularia diffusa* Allmann, *elongata* Lmx., *tenera* Sars, *maplestonei* Bale, *huttoni*, *Diphasia mutulata* Busk, *Dynamena tubuliformis* Markt." Of the above species *Diphasia alata* and *D. mutulata*, *Sertularia filicula* and *S. abietina* belong to *Diphasia* (the two latter to the subgenus *Abietinaria*), *Sertularia argentea*, *S. cupressina*, *S. tenera* and *Dynamena tubuliformis* to *Sertularia*, *Thujaria thuja* and *Th. lonchitis* to *Thujaria* and *Sertularia maplestonei* to *Odontotheca*. An opercular apparatus has hitherto not been found in *Sert. elongata* and *S. huttoni*, both of which have the hydrothecal margin provided with 6—7 teeth, and if they possess an operculum I am most inclined to think that it consists of as many valves as there are teeth. In either case these two species cannot be referred to any of the hitherto described genera. —

Schneider[1]) after having given the above phylogenetic sketch declares, that to penetrate deeper into the phylogeny of the *Sertulariidae* the close examination of a large living material shall be necessary, especially in order to make a thorough study of the difficult opercular apparatus. I quite agree with the author on this point, but as long as he adheres to the view that the colonial characters are the true generic characters, I cannot see that the results of such a study may be of any great use to him. He concludes his phylogenetic considerations with the following wish: „So steht denn zu hoffen, dass die zukünftige Forschung wohl im Einzelnen das hier vertretene System näher ausbauen und erläuteren, nicht aber es zu Gunsten eines einzelnen diagnostischen

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[1]) p. 524.

Charakters umstürzen wird; denn die Fundamente scheinen mir durch die innigsten Beziehungen zur Phylogenese als sichere erwiesen". I, on the contrary, take the liberty to express the collegial wish that the considerations and studies contained in this paper may help Dr. Schneider to change his view about the systematic significance of the colonial characters. —

Professor Kristine Bonnevie who has published several papers on Norwegian and North-Atlantic Hydroids, among which is the report on the Hydroids from the Norwegian North-Atlantic Expedition, quite agrees with Schneider in his systematic view, and in the last named work says about the systematic arrangement proposed by the present author[1]): "In this family as in *Campanulinidae* Levinsen has made a division of genera based upon the nature of the lid of the hydrotheca. But the remark that I made previously is also applicable here, namely, that the nature of the lid and of the margin of the hydrotheca, are very good specific distinguishing features, but that in basing a system upon these characters we ascribe to them too much importance." Though the author thus acknowledges the diversities found in the opercular apparatus at least as very good specific characters she does not mention the structure of the operculum in any of the species named in her work, not even in the new species described by her.

While Bonnevie gives to each species the name of the group to which it is referred, another follower of Schneider's system, Mr. H. B. Torrey[2]) does not think it necessary, and, besides, as far as I understand him, thinks it an advantage not to do so. He expresses himself as follows: „Anyone who has had occasion to work among the *Sertulariidae* will admire the masterly way in which Nutting has dealt with the perplexing questions of classification in that family. I am not yet prepared, however, to abandon Schneider's plan of segregating the species into typical groups which shall take the places of genera. These groups do

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[1]) 12, p. 76.
[2]) 58, p. 21.

not necessarily give their names to the species which the include. Thus they discourage the growth of synonyms, offer no awkward bars to the free passage of any species from one group to nearer relatives, and at the same time lessen the confusion which the present unsettled state of opinion regarding the relationships of existing species tends to produce." When the groups are to take the places of genera, one should believe that the generic names must be quite superfluous except as synonyms, and I am at a loss to understand in what manner this retention of them may be able to diminish the growth of synonyms or to lessen confusion of any kind, as I am much more inclined to think that this method would have quite the opposite result.

In the year 1904 Professor C. C. Nutting, Iowa, published a most valuable work on the American *Sertulariidae*, in which as a result of his systematic investigations into this family he sets forth the assertion that the characters taken from the operculum and the hydrothecal margin are insufficient in themselves to furnish a base for the classification of the *Sertulariidae*[1]), though he „thinks them most important aids in defining certain genera" and. besides, he quotes parts of an unpublished manuscript on the structure of the operculum written by Mr. J. H. Paarman[2]). according to which the representation the present author has given of the operculum in the *Sertulariidae* is incorrect. I am first to treat the latter point, and the following representation of the results to which the two authors have arrived chiefly refers to *Sertularia pumila.*

According to the named authors the hydrothecal margin is provided with two lateral teeth, between which there are stretched two quite homologous membranes of unequal size, the abcauline being considerably larger than the adcauline one. They form together the side-walls of an A-tent, the front and rear of the tent being closed by the two opposite hydrothecal teeth, and there-

[1]) 44, p. 41.
[2]) 44, pp. 20, 40.

fore, the two membranes which are both regarded as flaps meet in a straight line that would be represented by the ridge pole of the tent. When the hydranth emerges in the outer world for the first time the first cleavage takes place along this line, but it continues until there is room for the egress of the hydranth, leaving the bottom of both flaps still attached to the hydrothecal margin. Mr. Paarman's investigation seems to prove that..... "Sometimes the adcauline piece is attached while the other is free, and sometimes the reverse is true. Often the sides of a flap are attached for a greater or less distance proximally while they become free distally, the degree of attachment varying greatly in the same species. In most cases both flaps are functional". Paarman and Nutting seem to have overlooked, that in *Sertularia pumila*[1]) the adcauline wall is angularly bent from side to side and is provided between the two larger teeth with a much smaller one, which divides the adcauline sinus into two lateral halves but does not reach the free margin of the adcauline membrane stretched between the two larger teeth. This membrane which must be regarded as the distal part of the adcauline wall is of course also angularly bent, and the ridge dividing it into two lateral halves arises from the tip of the median tooth. The much larger abcauline membrane consists, as the corresponding part of a *Thujaria* and a *Diphasia*, or as one of the three or four corresponding parts of a *Sertularella*, of a proximal part, fixed in the abcauline sinus, and a distal free valvular part provided with an angularly bent margin which fits into the corresponding sinus formed by the adcauline membrane. When the hydrotheca is closed, the adcauline membrane on account of its thinness inclines a little towards the centre of the aperture, and its free margin meets that of the adcauline valve, but a perfect closing of the hydrotheca can only take place when both membranes are fixed in their corresponding sinusses to the very tips of the teeth, and this is always

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[1]) Pl. IV, fig. 14; 27, pl. 11, figs. 1—3.

the case in every undamaged hydrotheca. The one cause of Paarman's mistake is that he has regarded these opercula only from the side and not from the abcauline surface. When such a closed hydrotheca is regarded from the side we get the impression of an A-tent, as we see a straight line limiting two membranes which might be regarded as two flaps, but this line is only the one side of the free abcauline triangular valve, which on closing fits into the corresponding sinus formed by the angularly bent adcauline membrane. The other cause is that he has studied these opercula by the aid of microtomic sections, as there can be no doubt that the cutting in many cases must have in different degree loosened the connection between the fine membranes and the hydrothecal margin. Therefore he has found that the degree of attachment between the membranes and the hydrothecal margin is very different even in the same hydrotheca, but as a rule both membranes have been torn away from the hydrothecal teeth („as a rule both flaps are functional").

Though I must, therefore, maintain the correctness of my earlier investigation I am willing to admit, what I formerly denied, that the adcauline membrane may be regarded as a part of the opercular apparatus, and that the operculum of *Sertularia* therefore may be called a two-lipped operculum. For this renewed investigation I have examined fresh material taken in the Trondhjemsfiord by Mr. O. Nordgaard, and I have used the same mode of preparation as earlier, namely with a fine needle to cut off under the microscope the distal end of the hydrotheca and thereafter to examine it in different positions. Colouring matter may help to make the membranes more distinct.

After having expressed his agreement with Mr. Paarman's results Professor Nutting continues: "But there is still another and even greater objection to relying exclusively upon the characters of the margin and operculum in classifying the *Sertulariidae*, and that is that these characters are inconstant not only in some of its genera, but also in some individual species." To prove the

correctness of this assertion the author selects 8 species of the 128 treated in his work, in which the characters taken from the margin and operculum either are not found in some species of a certain genus as defined by him or in some species of two other genera show a supposed variation or inconstancy, and as a consequence hereof he prefers to use as chief characters in the limitation of most genera diversities in the arrangement of the hydrothecae or in the form of the colony, but at the same time he lays the chief stress on the opercular apparatus and the form of the hydrotheca in the diagnosis of the two genera *Diphasia* and *Abietinaria*. I intend here to undertake a critical examination of the genera proposed by Prof. Nutting, and under each genus I shall mention not only the species in which this author has thought he found inconstancy in the hydrothecal characters, but also those which to my opinion ought to be referred to another genus. —

In his work on the American *Sertulariidae* Prof. Nutting gives the following diagnosis of the genera as far as concerns the trophosomes, but as the gonosomes on the whole play a very insignificant systematic part, I have not found it necessary to refer to that part of the diagnosis concerning these structures. I shall later mention these structures in my own diagnoses of the same genera.

Sertularia (L.) Nutting.

"Hydrothecæ in strictly opposite or rarely subopposite pairs. Stem and branches normally divided into regular internodes, each of which bears a pair of hydrothecæ, but sometimes there are more than one pair to the internode, in which case the hydrothecæ are strictly opposite. Operculum normally of two flaps."

Thujaria (Flem.) Nutting.

"Hydrothecæ normally subopposite to alternate, and more than two to each internode. Internodes vary greatly in length. Hydrothecæ with smooth margin, or with one or two teeth usually more or less immersed in the hydrocaulus. Operculum of one abcauline flap, or of two flaps."

Pasythea (Lamour) Nutting.

"Hydrothecæ biserial, strictly opposite, arranged in groups of pairs, a group to an internode, the upper pair being smaller and differing in shape from the lower, margin bilabiate, with a too-flapped operculum."

Sertularella (Gray) Nutting.

"Hydrothecæ biserial, strictly alternate, usually with three or four marginal teeth and a well-marked operculum with three or four flaps. Rarely the teeth are obliterated, in which case the operculum is stretched across the hydrothecal aperture like a drumhead. Branches never regularly anastomosing to form a reticulate flabellate structure."

Dictyocladum Allm.

"Colony flabellate in form. Branches anastomosing and forming a rudely reticulate structure or network. Hydrotheca on more than two sides of the stem. Aperture without conspicuous teeth. Operculum variable."

Diphasia (Agass.) Nutting.

"Hydrothecæ biserial, opposite or alternate, aperture broad, operculum evident, of a single adcauline flap."

Abietinaria (Kirchenp.) Nutting.

"Hydrothecæ non strictly opposite, more or less bottle-shaped (the proximal portion turgid, distal portion narrowed), operculum of a single adcauline flap, margin usually without teeth.

Selaginopsis (Allm.) Nutting.

"Hydrothecæ arranged in more than two longitudinal series, at least on distal parts of branches, or in two or more series each of which has the distal ends of the hydrothecæ turned alternately to the right and left. Operculum of a single abcauline flap. Internodes long or absent."

As chief characters for the two genera *Sertularia* and *Thujaria*, to which the author only refers species with two-serial hydrothecæ, he uses both the different arrangement of the hydrothecæ and the length of the internodes. The hydrothecæ may be

opposite or alternate, but between these two conditions there is found all possible intermediate stages (strictly opposite, opposite, subopposite, subalternate, alternate, strictly alternate), and in many species a certain variation is found even within the same colony The internodes may be of very different length, bearing one to many pairs of hydrothecæ, and also in this respect many species present great variation within the colony. When the internodes are very short the hydrothecæ must of course be opposite, and the alternate hydrothecæ, therefore, must be found in longer internodes, but the latter are not rarely provided with opposite hydrothecæ (*Thujaria lichenastrum* Pall., *Th. sinuosa* Bale e. t. c,). In opposition to what is said in the diagnosis we very often in species of Nutting's *Thujaria* find internodes with a single pair of hydrothecæ, and the author f. inst. figures branches of *Th. polycarpa*, *Th. argentea* and *Th. tenera*, which bear a series of 2—4 such internodes. In *Sertularia grisea* Kirch, which is provided with internodes bearing 1—5 pairs of subopposite hydrothecæ, I have seen branches with up to 12 such internodes. According to the diagnosis of *Sertularia* there may be found in the genus subopposite hydrothecæ, but when the internodes bear more pairs of hydrothecæ the latter are said to be strictly opposite. I do not understand why they may not be subopposite, but in either case they seem to be so in a rudiment of *Sert. Challengeri* figured by the author. It is evident, that the different arrangement of the hydrothecæ cannot give us a distinct delimitation between the two genera, and if we use the different length of the internodes we meet with the same difficulty when we try to draw a boundary line; but even if it were possible by means of the above characters to divide the species into two sharply separated groups, the latter would still be artificial, if we paid no attention to the structure of the hydrothecæ and both groups contained species belonging to different natural genera.

Sertularia (L.) Nutting.

We may first regard the inconstancy in the structure of

the hydrothecal margin and the operculum which Prof. Nutting believed he found in *Sertularia desmoides* Torr., and which he mentions in the following way: "No marginal teeth as a rule, but at times the margin has two obscure teeth. Operculum usually of one flap attached to the abcauline side, others with two ill-defined flaps, and again there will be two flaps one above the other, both attached to the abcauline side." *S. desmoides*, of which Prof. Nutting has been so kind as to send me a number of specimens, is a good *Thujaria* according to my definition of the genus, though it corresponds well to his definition of *Sertularia*. It has a quite similar aperture to that found in *Th. lichenastrum* and *Th. (Pasythea) acrodon*, being provided with a freely prominent distal adcauline wall. In the specimens examined a number of hydrothecæ have been regenerated, and Prof. Nutting may have mistaken the freely prominent part of the new distal wall for an adcauline flap. The regeneration also explains the presence of two abcauline flaps one above another.

In the key to the species the author mentions that three of the species, *S. rathbuni*, *S. brevicyathus* and *S. flowersi* are provided with a small median tooth. Such a tooth, however, is also present in *S. pumila*, and according to the author's figures also in *S. mayeri*, and *S. cornicina*. *S. rathbuni* has not a three-flapped operculum; but the author has mistaken the angularly bent adcauline lip for two separate opercular valves.

S. operculata, *S. bispinosa* and *S. pulchella* belong to my new genus *Odontotheca* the definition of which is given later.

Thujaria (Flem.) Nutting.

Only four of the twenty species named in Prof. Nutting's work, namely *Th. thuja*, *Th. polycarpa*, *Th. immersa* and *Th. lonchitis* belong to my genus *Thujaria* while 10 belong to *Sertularia*, and in two of these, *Sert. tenera* and *Sert. robusta* the author seems to have found inconstancy in the structure of the hydrothecal margin and operculum. The named structures of *S. tenera* he mentions in the following way: "margin varying greatly, some-

times being round without teeth and often being curved, with two teeth of regular sertularian type. Operculum usually composed of one flap attached to the abcauline side of margin, but sometimes composed of two flaps." "This species appears to break down the generic distinctions proposed by Levinsen in that it has both a one-flapped and a two-flapped operculum in the same specimens." About the same parts of *S. robusta* he says: "operculum with two flaps on distal portion of branches, often with round margin and single abcauline flap on proximal portions."

Both in my paper on the regeneration of the Hydroids[1]) and in that on the Hydroids from Greenland[2]) I have pointed out, that in the new apertures produced by the regeneration of a hydrotheca in a *Sertularia* the contrast between the thicker and the thinner (membranous) parts of the wall often seem to be indistinct or quite lacking, and as a distinct example hereof I have named *Sertularia tenera*. As I have examined many colonies of this species without finding any other inconstancy in the parts named I am sure that the round apertures found by Prof. Nutting, must have belonged to regenerated hydrothecæ and Ritchie[3]) has come to the same result as I. Of *Sertularia robusta* I have examined a colony from Bering Sea sent to me by the National Museum of Washington. All the hydrothecae present the *Sertularia*-characters very distinctly, and when Prof. Nutting in a number of hydrothecae from proximal portions of branches has found a different form of aperture and operculum, it is no doubt due to cases of regeneration.

Nutting[4]) declares that the operculum is almost an ideal character to use in separating the genus *Diphasia*, but that he nevertheless prefers the colonial characters is seen from his reference of *Sertularia thujarioides* Clark to *Thujaria*, though it pos-

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[1]) 32 a, p. 22.
[2]) 32, p. 189—190.
[3]) 53, p. 218.
[4]) 44, p. 44.

sesses an adcauline operculum and a horizontal margin, characters which have not been found in any *Thujaria*. Broch has already pointed out that it must be referred to *Diphasia*. To the latter genus I am also inclined to refer *Th. elegans* Krp. *Th. ramosissima* Allm. and *Th. plumosa* Clark belong to my new genus *Odontotheca*, and I shall later show that *T. plumulifera* Allm.[1]) belongs to the genus *Hydrallmania*. However, a fragment sent to me by Prof. Nutting under the name of *Th. plumulifera* does not belong to this species, but to a new species of the genus *Sertularia*.

Pasythea (Lamour.) Nutting.

This highly artificial genus is at present represented by three species, namely *P. qvadridentata* Ell. & Sol., *P. hexodon* Bale and *P. philippina* Markt. The first, which is a *Sertularia*, is nearly related to *S. pumila*, the second, of which I have examined a colony from Singapore, is a *Thujaria* with a similar form of aperture to that found in *Th. desmoides*, *Th. lichenastrum* and *Th. fruticosa*, and the original specimen of the third which I have had on loan from the Zoological Museum of Vienna is a young colony of *Idia pristis*. That neither the colonial characters are constant is evident from some observations made by Bale[2]) who says about specimens of *P. qvadridentata* from Bondi: "The Bondi specimens are peculiar, a considerable proportion of the internodes bearing only a single pair of calycles each; indeed some of the shoots are so arranged throughout, and thus differ in no respect from a typical *Sertularia*." Further he says about the hydrothecæ of *P. hexodon*[3]): "In most cases those on the two sides of the hydrocaulus are opposite to each other, but it is quite common to find them alternate, and the set frequently contains more on one side than the other, as three to four, or four to six.

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[1]) I have examined a fragment of the original specimen, sent to me from the Museum of Comp. Zoology, Cambridge.

[2]) 8, p. 770.

[3]) 8, p. 771.

Sertularella (Gray.) Nutting.

Among the species which Nutting selects as examples showing inconstancy in the hydrothecal characters are the following three species, which he refers to the genus *Sertularella*. For each of them we shall quote that part of the author's description which refers to the hydrothecal margin and the operculum:

S. formosa Fewkes. "Aperture perfectly round and smooth. Operculum apparently wanting. Sometimes, however, it appears in the shape of a thin membrane stretched like a drumhead across the aperture."

S. Hartlaubi Nutting. "Margin perfectly smooth and even; operculum in some cases an adcauline flap; in others apparently an irregularly ruptured membrane, stretched across the aperture like a drumhead."

S. magna Nutting. "Operculum thick conspicuous, a simple membrane of a simple flap where the margin is even, with two flaps when there are two evident teeth, sometimes apparently with more than two flaps, but they are not well defined, probably because the teeth when three or four, are very low and inconspicuous. No better example could be found of the futility of basing generic distinction on the number of parts to the operculum. One branch could be placed in three different genera, were that criterion to be used."

I have not seen the two first named species, but the descriptions and the figures leave no doubt that they cannot be referred to *Sertularella*. There is not the faintest indication of marginal teeth, and the thin membrane stretched like a drumhead across the aperture is no doubt the original membranous roof of the hydrotheca, which is found in all *Thecaphora*. The author does not mention whether he has found this membrane also in old hydrothecae. It is possible that a number of *Sertularella*-species may have developed from that group, to which they belong, by a transformation of the membranous roof into a *Sertularella*-operculum, but as they themselves lack the chief-characters of

Sertularella I cannot refer them to this genus. We might with the same right refer f. inst. the inoperculate species "*Obelia*" *marginata* Allm.[1]), *Campanularia insignis* Allm.[2]) and *Camp. juncea* Allm.[3]) to *Thyroscyphus*, because they agree with the species of this genus in the form and the arrangement of the hydrothecae.

From the National Museum of Washington I have received a small fragment of the original specimen of *Sertularella magna* Nutt. It contains 12 hydrothecae, the 6 of which have the margin more or less injuried, while in the 6 others it is intact, and provided with three distinct curves, divided from each other by as many distinct teeth (pl. IV, figs. 27, 28). When regarded from above the aperture is distinctly triangular with curved sides. In none of them have I found a complete operculum, but in some of them small remnants of the opercular valves still adhere to the curves, and in a single hydrotheca two complete valves are fixed each in its curve while the third is missing. The species seems to be very fragile, but there can be no doubt that the hydrothecae when undamaged are provided with three opercular valves, and that Nutting's divergent statement must be explained as an incorrect interpretation of acccidental injuries. The hydrothecae have been regenerated 4—6 times.

Dictyocladium (Allm.) Nutting.

The latter part of Prof. Nutting's diagnosis of *Sertularella* does not mean that an operculum of three or four valves cannot be found in species which possess a flabellate colony with anastomosing branches, but only that such species are referred by the author to the artificial genus *Dictyocladium*. While *D. dichotomum* Allm. does not seem to possess an operculum the two other species referred to this genus, *D. flabellum* Nutt. and *D. reticulatum* Krp. belong to *Sertularella*. Of the latter species I have examined a fragment sent to me from the Zoological Museum of Hamburg, and

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[1]) 1, pl. VI, figs. 1, 2.
[2]) 5, pl. IX.
[3]) 2, pl. 11; figs. 3, 4.

in the best preserved hydrothecæ I have found a distinctly three-toothed margin and three opercular valves.

Diphasia (Agassiz) Nutting.

Of the nine species mentioned in Nutting's work I must refer *D. corniculata* (Murray) to *Sertularia*, and *D. tamarisca*, which possesses a three-toothed hydrothecal margin and three opercular valves, to *Sertularella*.

Abietinaria (Kirchenpauer) Nutting.

Of the 16 species, which Nutting refers to this genus, I have here to mention three, namely *A. compressa* Mereschk., *A. Alexanderi* Nutt. and *A. greenei* Murray, and of the two latter species I have examined specimens sent to me by Prof. Nutting. The first-named species, which the author no doubt refers to *Abietinaria* because of the form of the hydrothecae, is according to Mereschkowsky provided with two lateral teeth, and as such are not found in any species of that genus, I cannot doubt but hat it belongs to *Sertularia*. *A. Alexanderi* is also a *Sertularia*, being provided with two lateral teeth, an angularly bent adcauline membrane, and an abcauline membrane, which ends with a free valve.

The hydrothecae of *A. greenei* are as pointed out by Nutting subject to great variation, the abcauline margin being in most of them provided with two more or less developed teeth, while a number of the proximal hydrothecae in each branch have a plain margin without teeth. The specimen examined by me seems to contain only dead hydrothecae, and I have found only a small number of opercular membranes, a few of which reached from the adcauline margin to the tips of the teeth, and, therefore, I am most inclined to refer this species to my new genus *Odontotheca*. In such hydrothecae which have no teeth the opercular membrane must be provided with a free abcauline margin, and this species therefore seems to form a connecting link between *Odontotheca* and *Abietinaria*. The hydrothecae are provided with a small internal adcauline tooth, and a similar more or less developed tooth I have

found both in a number of species belonging to the latter group and in *Odontotheca macrocarpa* Bale.

A species, which presents a still greater variation, is *Thujaria heteromorpha* Allm.[1]), which according to the author possesses two different forms of hydrothecae, some in which the margin is nearly circular and even directed away from the supporting internode, and others[2]) in which it is "directed towards the internode, and has its apocauline margin produced into a short, slightly incurved tooth." While the former are placed in the proximal part of the branches, the internodes of which carry many hydrothecæ, the latter are seated in the distal part, and here each internode bears a single pair of hydrothecæ. A further difference is that the hydrothecæ of every pair are in some internodes connate to one another, but in others separate.

Allman expresses his doubt as to the correct reference of this species to *Thujaria* in the following way: "Amid systematic characters pointing in so many different directions, it would seem difficult to decide on the true generic position of our Hydroid," and I shall hereto remark that we shall only be able to solve this question when we get information about the structure and position of the operculum, but otherwise the shape and position of the aperture in the two different forms of hydrothecæ leave little doubt that the species must belong to the genus *Diphasia.*

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[1]) 4, p. 147.

[2]) According to the figures given by Allman the last named hydrothecae have quite the same form as those found in *Thujaria pharmacopola* Allm. (5, p. 66), but as pointed out by Billard (10, p. 1357) the latter species is identical with *Diphasia alata* Hincks, and the hydrothecae of this species have not the slightest likeness with Allman's picture, their abcauline margin being broadly rounded and not at all acuminate. Therefore I am not quite sure, whether the corresponding hydrothecae of *Th. heteromorpha* are correctly figured. In the same paper Billard points out that *Thecocladium flabellum* is a *Sertularella*, that *Thujaria pectinata* is identical with *Th. articulata* Pall. and *Th. vincta* with *Sertularella quadridens* Bale. Having examined myself fragments of the original specimens of the three first named species I can confirm as to them the correctness of Billard's observation.

The author further adds[1]): "The features here noted in *Thujaria polymorpha* bring to mind a phenomenon not unknown in the vegetable kingdom; as in the case of certain ephiphytical orchids, in which flowers whose differences of form are such as to have caused them to be regarded as characterizing so many distinct genera, are nevertheless found associated in one and the same plant." I do not think, however, that the last named case has induced any botanist to prefer systematic characters taken from the form of the inflorescences to those presented by the individual flowers.

Hydrallmania (Hincks) Nutting.

I shall later mention this genus to which Prof. Nutting besides *H. falcata* refers two other species, *H. distans* Nutting and *H. franciscana* (Trask).

Selaginopsis (Allm.) Nutting.

While Mereschkowsky to this genus refers all *Sertulariidæ*, the hydrothecæ of which are arranged in more than two longitudinal series, Allman excepts such species which may be referred to the artificial genera *Pericladium* Allm. and *Dictyocladium* Allm. According to the above definition Nutting only refers to *Selaginopsis* such polyserial species, which belong to my genera *Thujaria* and *Sertularia*, and of the species named in his work in either case *S. mirabilis* must be referred to *Sertularia*, but I am not sure, whether this may not be the case with some of the others, as f. inst. *S. ornata* and *S. pinnata*[2]).

Among the species which Prof. Nutting in the general part of his work selects to show the inconstancy of my systematic characters is also *S. mirabilis*, about which he says: "In *Selaginopsis mirabilis* (Verrill) there are two flaps to the operculum, while the one-flapped operculum is characteristic of the genus as a whole. I do not believe that any one would separate *S. mirabilis* and *S. cylindrica* (Clark) generically, and yet they differ in this feature upon which Levinsen bases his genera."

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[1]) 4, p. 148.

[2]) I have not seen these two species.

That the genus *Selaginopsis* according to the different manner in which it is understood by different authors contains species with two, three or four different forms of opercular apparatus is to my opinion a proof that the genus is an artificial assemblage of species, belonging to different genera, and not as Nutting means a proof that my systematic characters are inconstant. But even if all the species contained in the genus were provided with the same form of opercular apparatus I should reject it as unnatural if it were based on the chief character, that the hydrothecæ are arranged in more than two longitudinal series, as I should reject a Bryozoan genus containing for inst. the *Caberea*-species provided with more than two longitudinal series of zooecia. I do not deny that *Sel. mirabilis* and *Sel. cylindrica* have a very similar habitus because of the similar arrangement of the hydrothecæ, but the outer likeness ought to have nothing to do with the systematic arrangement, and as the two species show a distinct difference in the structure of the hydrothecal margin I must put them into two different genera.

As Prof. Nutting has come to the incorrect result that the characters taken from the operculum and the hydrothecal margin are inconstant, he has in the systematic arrangement of the *Sertulariidæ* committed the same error as most authors, of laying chief stress on the colonial characters, and if his genera do not contain such a heterogeneous assemblage of species as Schneider's groups, it is only because he has paid more attention to the structure of the operculum. His best defined genera therefore, are *Abietinaria* and *Diphasia*, in which the chief character is the adcauline position of the operculum, while the colonial characters used are essentially negative.

Before proceeding to give definitions of the single genera of the *Sertulariidae* I shall set forth some considerations on the relation between the four families *Campanulariidae, Lafoëidae, Campanulinidae* and *Sertulariidae* in order to define the systematic position of the latter family.

The four families may be defined in the following manner: *Campanulariidae*: The campanulate or cup-shaped hydrothecae which not rarely present longitudinal ridges and marginal teeth are as a rule provided with a well-developed stalk, and with few exceptions (*Hypanthea, Silicularia*) show a poly-symmetrical structure. A diaphragm is always present, but sometimes only in the shape of a marginal thickening. Nematophores are never present. No operculum. [A club-shaped proboscis].

Lafoëidae: The elongate, cup-shaped, retort-shaped or tubular, short-stalked or sessil hydrothecae, which never present longitudinal ridges or marginal teeth, not rarely show a more or less pronounced bilateral symmetry, and their adcauline wall is in many cases in different extension more or less firmly connected with the stems and branches. A diaphragm may be absent or developed in different degree. Nematophores are sometimes present. No operculum. [A conical proboscis].

Campanulinidae: The more or less elongate, cup-shaped, pitcher-shaped or tubular, sessile or stalked hydrothecae, which never present longitudinal ridges or marginal teeth[1]), sometimes show a bilateral symmetry, and are rarely provided with a complete diaphragm. Nematophores are sometimes present. A differently formed operculum. [A conical proboscis].

Sertulariidae: The pitcher-shaped, retort-formed or tubular, bilaterally developed hydrothecae lack a free stalk, and the ad-

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[1]) S. F Clark (16, p. 12) has described a species of *Campanulina, C. denticulata*, in the hydrothecae of which he thought he found besides an operculum of convergent segments an equal number of large castellated marginal teeth arising outside the latter. As both the marginal teeth and the operculum must have been formed as a secretion from the ectoderm we cannot understaud the formation of the teeth, as the corresponding part of the ectoderm should have been placed outside the operculum. There can be no doubt but that the "castellated teeth" are only the worn segments of an old operculum. The figures 6 a and 6 b, therefore, represent two hydrothecæ. which have been regenerated three times, and the only hydrotheca (fig. 7) in which the author could "find no trace of teeth, only an operculum" is a hydrotheca which has not been regenerated.

cauline wall is as a rule in different extension firmly connected with the stems and branches. A complete diaphragm is as a rule developed. Nematophores are never present. An operculum is always present, consisting of 1—4 opercular membranes or valves fixed in corresponding sinuations of the margin. [A conical proboscis].

Of the characters named in the above diagnosis I have put that which concerns the form of the proboscis in parenthesis, as I have only been able to verify it myself in rather few forms, the proboscis being a structure, the form of which can only be examined with advantage in well-preserved material. I am not sure, therefore, that it really presents so sharp contrasts that the *Campanulariidae* by the aid of the above named character can be sharply divided from the three other related families. According to Allman[1]) and Hincks[2]) we have to discern between two forms of proboscis, a "conical", present in the large majority of the Hydroid families, and a "trumpet-shaped" which has only been found in the *Eudendriidae* and the *Campanulariidae*. While Hincks in the diagnosis of the latter family calls the proboscis "trumpet-shaped", in the diagnosis of the genus "*Campanularia*" he speaks about a "cup-shaped" proboscis, and as these two terms therefore must be synonymous, it is evident that Hincks when he uses the expression "trumpet-shaped" especially thinks of the expanded end of a trumpet. The two latter terms, however, are very unlucky and misleading, as every proboscis in its expanded state is "cup-shaped" or "trumpet-shaped", while at the other side the proboscis of *Eudendrium*, *Campanularia* and *Laomedea* is "club-shaped" or bulbiform, not only according to my own examination of well-preserved material, but also according to figures given by Allman and Hincks. In well-preserved specimens of *Sertularella tricuspidata* and *Halecium muricatum*, lately brought home from Greenland, I have found that the expanded proboscis is "cup-shaped" while it is conical in its contracted state, and when Hartlaub[3]) in his work on *Sertularella* says about the proboscis of this genus: "Die

[1]) 1 a. [2]) 22. [3]) 19, p. 12.

Proboscis der Hydranthen ist nach vortrefflich conservierten Exemplaren zu urtheilen nicht conisch sondern wie bei den *Campanulariden* trompetenförmig," I cannot doubt that he here speaks about the expanded proboscis. Besides in the monograph of Hincks, we find figures of the contracted campanularian proboscis also in a paper of Pictet[1]), in which he figures a number of *Clytia*-species, the proboscis of which he designates as "hypostome en trompette", but according to the figures it is club-shaped, and the same form shows the proboscis of *Hebella lata* Pictet, the hydrothecae of which are much more campanulate than in most members of the family *Campanulariidae.*

According to the systematic arrangement expressed in the above diagnosis, all the operculate forms have been referred to the two families, the *Campanulinidae* and the *Sertulariidae*, and all the inoperculate to the *Lafoëidae* and the *Campanulariidae.* While the presence of an operculum sharply divides the operculate from the inoperculate families, the two families contained in each of the two groups are not sharply divided from each other by a single character, if we do not possess such a difference between the *Campanulariidae* and the *Lafoëidae* in the form of the proboscis. Broch[2]) and Kramp[3]) believe they find such a distinguishing character in the different appearance of the gonothecae, which according to these authors in the *Lafoëidae* always present themselves united into more or less densely crowded aggregates ("Coppinia", "Scapus"), while in the *Campanulariidae* they appear singly. But in both families there are a number of exceptions to this rule. In the *Lafoëidae* large singly placed gonothecae have been found in *Lafoëa (Halisiphonia) megalotheca* Allm.[4]); *Hebella calcarata* Ag.[5]) and *H. cylindrica* v. Lend.[6]), and by the present author in

[1]) 46.
[2]) 13, p.
[3]) 30, p. 370—71.
[4]) 5.
[5]) 6 a, p. 122, figs. 190—191.
[6]) 46, p. 41, pl. II, fig. 36.

H. contorta Markt.[1]) (Pl. V, figs. 16, 17) and *Lafoëa venusta* Allm.[2]). Such large singly placed gonothecae have also been found in two species of the genus *Cryptolaria*, namely in *Cr. abyssicola* Allm.[3]) and *Cr. diffusa* Allm.[3]), while two other species, *Cr. longitheca* Allm.[4]) and *Cr. conferta* Allm.[3]) have a Coppinia. Nutting[5]), however, ascribes to the whole genus *Cryptolaria* "a compact Coppinia" mass much as in *Lafoëa*", and the reason hereof is the following. Pictet and Bedot[6]) have found in *Perisiphonia pectinata* a Coppinia surrounding a portion of the stem and, besides, two small singly placed gonothecae, seated each in the proximal part of an adjacent branch. As Nutting[7]) and Broch[8]) have found that the Coppiniæ, examined by them, contain gonothecae of both sexes, Bedot suggests that the single gonothecae found in the named *Perisiphonia* may represent a different sex from those in the Coppinia, and Nutting, therefore, no doubt, compares the single gonothecae found in the above *Cryptolaria*-species with those found in the *Perisiphonia*, and thinks that a coppinia may appear later. I do not think, however, that Bedot is right in his supposition. It is a well-known fact that a Coppinia may often

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[1]) 36. Pictet (46) regards *Hebella cylindrata* Markt., *H. contorta* Markt., and *H. scandens* Bale as identical with *H. cylindrica* v. Lend., and Billard thinks that the same is the case with *H. calcarata* Ag., but be adds the following remark: "Comme Pictet le fait justement remarquer on ne pourra être complètement fixé sur l'identité de toutes ces formes que lorsqu'on aura trouvé et comparé leurs gonosomes" (11, p. 17). The gonothecae of *H. contorta* seem to be very different from those of *H. calcarata* and *H. cylindrica*, figured by Agassiz and Pictet. Their (Pl. V, figs. 16, 17) distal end is divided into 4—6 triangular areas, which no doubt correspond to as many opercular valves. The gonothecae of *H. scandens* Bale (8, pl. XIII, fig. 18) seem to show a similar structure.

[2]) 3.

[3]) 5.

[4]) 15 a.

[5]) 45, p. 946.

[6]) 47, p. 21, pl. V.

[7]) 45 a.

[8]) 13, p. 155.

extend from a stem over more adjacent branches, and, therefore, I cannot doubt but that we have to do in the named case with the beginning of such an extension. In opposition to the numerous small gonothecae of the Coppinia, which take their rise from the peripheral tubes, the few large elongate sacs in the named *Cryptolaria*-species spring from the axial tube, and it is not reasonable to suppose, that in these species the gonothecae of the two different sexes should develop in two so very different manners.

While in the true "Coppinia" the gonothecae are mutually coalesced, the "scapus" is only a collection of more or less densely crowded, but mutually not connected gonothecae. But quite similar, more or less dense aggregates of gonothecae are also found in other families, f. inst. in species of the campanularian genus *Silicularia (= Hypanthea)* [1]), in *Campanularia integra* and in a number of *Halecium*-species, f. inst. in *Hal. muricatum*, in *Hal. groenlandicum* Kramp [2]), and in a new species from Japan, which differs from the last named species therein, that the hydrothecae are perfectly adnate. In the two latter species the gonothecae are borne together with a number of hydrothecae by a large, spongy, richly branched, free meshwork formed by a number of peripheral tubes.

To the *Lafoëidae* I refer besides the genera *Lafoëa (Halisiphonia)*, *Hebella*, *Grammaria*, *Cryptolaria*, *Perisiphonia*, *(Zygophylax*, *Brucella)* and *Lictorella* also the species referred to *Synthecium*, *Hypopyxis*, *Staurotheca*, and the inoperculate species referred to *Dictyocladium*, *Selaginopsis*, *Sertularia* and *Sertularella*. Also Schneider refers *Synthecium* to the *Lafoëidae* though from other reasons than I, but Hartlaub [3]), who earlier followed Schneider in this question, has altered his opinion, because he has found that the species of the latter genus are provided with a blind sack, a structure which he regards as characteristic of

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[1]) 5, p. 26.
[2]) 30.
[3]) 21, p. 670.

the *Sertulariidae.* But Hartlaub[1]) has also found a blind sack in the campanularian genus *Silicularia*, and I have found it in *Lictorella pinnata* Sars. It is also found in the operculate species described as *Zygophylax operculata* Jäd. (Pl. IV, fig. 21) and *Zyg. grandis* Vanh.[2]), and I cannot doubt but that it is also present as well in the inoperculate species related to them as in the other species of the genus *Lictorella*. The presence of the blind sack in the named cases, therefore, seems to be contingent upon the more or less pronounced bilateral symmetry.

v. Campenhausen who also refers *Grammaria* to the *Sertulariidae* says about my reference of *Synthecium* and the other above named forms to the *Lafoëidae*[3]): „Abgesehen aber davon dass die erwähnten Formen so typisch alle übrigen Sertularien-charactere bezitzen ausser diesen einen ..... und mir ..... eine Trennung nur auf ein Merkmal hin willkürlich vorkommt, scheint mir das Vorhandensein oder der Mangel eines Operculums durchaus nicht von so einschneidender Bedeutung zu sein." As v. Campenhausen does not seem to ascribe systematic significance to the arrangement of the hydrothecæ, the typical sertularian characters, about which he speaks, must be the bilateral symmetrical structure of the hydrothecae, and the more or less extensive connection between their adcauline wall and the corresponding axial structures[4]). As to the first named character there is no contrast between the named forms and the other *Lafoëidae*, as most members of this family and especially of its freely branched forms show a more or less distinct bilateral symmetry, which is found not only in species with sessile or adnate hydrothecae, but sometimes also in such species the hydrothecæ of which are provided with free stalks.

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[1]) 19, p. 12, note.
[2]) 59, p. 315.
[3]) 14 a, p. 301.
[4]) Jf v. Campenhausen regards the presence of a well-developed diaphragm as a specific sertularian character, I may here point out that the diaphragm is quite lacking or imperfectly developed in a number of *Sertularella*-species.

We find f. inst. that the hydrothecae of *Lafoëa fruticosa* and *L. gracillima* show a distinct adcauline convexity. As to the other sertularian characters the genera *Perisiphonia*, *Cryptolaria* and *Grammaria* have their hydrothecae adnate to the hydrocaulus in a larger or smaller part of their adcauline wall, and in the two last named genera this connection is as in the *Sertulariidae* inseparable, while in *Perisiphonia* it can be loosened by the aid of reagents. As, therefore, the above named forms cannot by a single character be divided from the *Lafoëidae*, I, on the contrary, find it arbitrary to refer them to the *Sertulariidae*, and at the same time there can be no doubt, but that the latter family gains in firmness and coherence by only embracing operculate forms.

In animals of so simple a structure as the Hydroid polyps we can only expect to find a few distinguishing marks between the systematic divisions, and most families and genera are only divided from each other by one or two characters. The two chief divisions, the *Athecata* and the *Thecaphora* are only divided from each other by the presence in the latter of more or less developed protective cases for the hydrants and the gonophores, and it seems reasonable to ascribe systematic significance also to the operculum, a structure, which must be regarded as the complement of the protective cases and, so to speak, as the end-result of the same effort, which has led to the formation of the hydrothecae and gonothecae. We may further point out as an evidence of its systematic importance, that it has that in common with other structures of systematic significance that it presents a rich development of characteristic modifications which give excellent generic characters.

We may now regard the relation between the *Lafoëidae* and the *Campanulinidae*. If we compare the two above family diagnoses we shall find that the two families are only sharply divided by a single character, namely the presence or absence of an operculum, all the other characters being more or less relative, and, therefore, there can be no doubt, that they are very nearly related

as already pointed out by Broch.[1]) He especially points out the near relation between *Toichopoma obliquum* and *Lafoëa*, and not only refers the former genus to the *Lafoëidae*, but is most inclined to refer the named operculate species to the genus *Lafoëa*, and when he provisionally uses the name *Toichopoma* it is only because the gonothecae of this species were at that time unknown. Kramp[2]) has later found that it possesses a "coppinia", but while he like Broch refers it to the *Lafoëidae*, he at the same time maintains that the presence of an operculum entitles this species to represent a proper genus. In a later paper Broch[3]) unites the *Campanulinidae* with the *Lafoëidae* and again divides the latter family into two sub-families, the *Grammariina*, in which the gonothecae are united into aggregates and the *Campanulinina*, in which that is not the case. From the reason given above I cannot accept this division.

The connection between the *Campanulinidae* and the *Lafoëidae* must no doubt be expressed in this way, that the *Campanulinidae* have arisen from the *Lafoëidae*, and this transformation has taken place in such a manner, that different members of the latter family have developed an operculum.[4]) Broch[5]) has pointed out the great likeness between *Toichopoma obliquum* and *Lafoëa gracillima*, but *Calycella syringa* and *Tetrapoma qvadridentatum* present a similar likeness to such *Lafoëa* species as *L. pocillum* and *L. pygmaea*. At the other side the species of the genus *Cuspidella* seem to stand in a similar relation to the species of the genus *Filellum*, in which we find two different forms of sessile hydrothecae, some,

[1]) 13, p. 159.
[2]) 30, p. 375.
[3]) 14, p.
[4]) As I do not believe in a sharp division between the *Lafoëidae* and the *Campanulariidae*, I think it likely that also a number of species of the latter family have developed an operculum, and we have no doubt two such examples in „*Campanularia*" *marginata* Bale (7, p. 54) and „*Camp.*" *macrocyttara* (Bale (7, p. 56), the wide cup-shaped hydrothecae of which have a four-toothed margin, and, therefore, no doubt, possess a *Thyroscyphus*-operculum. The double margin in the hydrothecae of the former species is no doubt due to a regeneration.
[5]) 13, p. 159.

the proximal half of which is adnate, and others which are cylindrical and erect. The first form of hydrothecae is represented in *Cuspidella procumbens* Kramp, and the second in such species as *C. humilis* and *C. costata*. The genus *Zygophylax* (*Perisiphonia*) which is provided with cylindrical nematothecae has given its contingent of operculate forms in the two species, *Z. operculata* Jäderh.[1]) and *Z. grandis* Vanh.,[2]) for which I must propose a new genus *Abietinella*, and *Oplorhiza parvula* Allm.,[3]) in which we find stalked, globular nematothecae stands in a similar relation to „*Campanularia*“ *armata* Pict & Bed.[4]) as the above new genus to the species of *Zygophylax*. The genus *Lafoëina* [5]) which possesses a similar form of operculum as *Cuspidella* and *Oplorhiza* only differs from the latter genus in the possession of very long vermiform nematothecae. The long slender, sometimes tubuliform hydrothecae of the genus *Stegopoma* leave no doubt as to the near connection of the latter genus with the *Lafoëidae*, and the different modes of growth of the different species show distinctly how little systematic significance we ought to ascribe to the colonial form. The operculum of this genus is very characteristic, consisting of two plaited membranes, fixed each in a curve, formed by the hydrothecal margin, and thus divided by two triangular hydrothecal teeth. When we find such an operculum in a number of species, presenting a different habit of growth, it is to my opinion more reasonable to think that they belong to the same natural genus, and that the different forms of growth have been produced by the influence of outer circumstances, than to divide these species according to the different colonial form, and to suppose that the same form of operculum may have arisen independently more than once. The latter standpoint has been taken by Prof. Nutting[6]) who has described three new

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[1]) 26, p. 376.
[2]) 59, p. 315.
[3]) 3, p. 14.
[4]) 47, p. 9.
[5]) 32.
[6]) 45, p. 943.

species of *Stegopoma*, but at the same time he refers a species provided with the same form of operculum to the genus *Cryptolaria*. However, he thinks it likely that a separate genus should be instituted for this species and for *Cryptolaria geniculata* Allm., which possesses a similar form of operculum. As a consequence of this standpoint Nutting mentions the genus *Stegopoma* as follows: "This genus ..... seems to me to be practically convenient whether a natural one or not." We meet in this genus with three different forms of growth. While *St.* (*Crypt.*) *operculata* Nutt. and *St.* (*Crypt.*) *geniculata* Allm. have a fascicled stem with an axial tube, *St. plicatile* and *St. gilberti* Nutt. possess a fascicled stem, in which all the tubes bear hydrothecae, and *St. fastigiatum* a creeping stem. The gonothecae are of two different forms which seem to be independent of the colonial form. In two species with a creeping stem, described by Nutting, we find sessile gonothecae of a similar form as the hydrothecae, and the same is the case in *St. gilberti*, while in *St. plicatile* and *St. geniculatum* the gonothecae are elongate sacs without an operculum.

Schneider[1]) thinks that the operculum of *Campanulina* (and *Operculariella*) must be derived from the hydrothecal teeth of certain *Campanulariidae*, which by attaining a sufficient length and thinness have been able to collapse and cover the hydranth after its retraction, but this is a more theoretical consideration, not sustained by any fact, and it may have been called forth by a comparion for inst. of the figures given by Hincks of *Gonothyraea gracilis* and *Campanulina turrita*, as the hydrothecal teeth in the former figure are very much like the segments of the operculum in the latter. But in *G. gracilis* as in all other dentate *Campanulariidae* the hydrothecal teeth are divided from each other by interstices which have once been filled by membranous parts, and these have been thrown off together with the hydrothecal roof. On the contrary in *Cuspidella*, *Lafoëina* and *Oplorhiza* as in *Campanulina* and *Operculariella* the operculum is formed by a continuous

[1]) 54, p. 512.

belt representing the upper part of the side-walls after the roof has been thrown off, and the only difference between the operculum in the three former genera and that of the two latter is that in *Campanulina* and *Opercularella* it has been cleft in a number of segments, which, however, together represent the whole belt. These segments are really not triangular, but about rectangular or tongue-shaped, and only seem to be triangular because they cover each others' margins. Besides, the proboscis of *Campanulina* and *Opercularella* is according to Hincks conical and not claviform as in the *Campanulariidae*, and on the whole there can be no doubt but that the two genera must be derived from the *Lafoëidae*.

The species of the genus *Thyroscyphus*[1]) remind us, both in the form of their short-stalked hydrothecae and in the structure of the colony, of such inoperculate species as „*Obelia*" *marginata* Allm.,[1]) „*Campanularia*" *insignis* Allm.,[2]) „*Campanularia*" *juncea* Allm.[3]) and „*Campanularia*" *rufa* Bale,[4]) all of which possess more or less elongate, somewhat bilaterally symmetrical hydrothecae. The form of the proboscis is not known in any of these species, but in *Th. simplex* I have found a conical proboscis, and the same form of proboscis has also been found by Ritchie in *Thyroscyphus simplex* Lmx. (non = *Th. simplex* Allm.), for which he has instituted the genus *Parascyphus*. The latter species is distinctly bilaterally symmetrical and provided with a blind sack, and Ritchie, therefore, refers it to the *Sertulariidae*, but as the hydrothecae have a short stalk I prefer to refer it to the *Campanulinidae*. It is, however, doubtful whether this species is sufficiently different from the species of *Thyroscyphus* to represent a proper genus. The tripartite operculum is not a sufficient, distinguishing character, and also the other species of *Thyroscyphus* present a more or less developed bilateral symmetry. Perhaps they also possess a blind sack.

A comparison between the different opercula found in the

[1]) 3.
[2]) 5.
[3]) 2.
[4]) 7.

Campanulinidae shows that we have to discern between 6 different types, and in two of these the operculum is formed of the whole hydrothecal roof. This is the case with the univalvular adcauline operculum of *Abietinella*, and with the three- or four-valvular operculum in *Thyroscyphus*, and *Tetropoma*.[1]) A third type is represented by the operculum of *Calycella*, which, as shown by Kramp,[2]) is formed of the peripheral part of the roof, while in the three last types it is formed of a smaller or larger distal part of the side-wall after the roof has been thrown off. In *Toichopoma* it is formed by an infolding of the side-wall at the one side, while in *Cuspidella*, *Lafoëina*, *Oplorhiza*, *Campanulina* and *Operculariella* it is formed of the whole distal part of the side-wall. The sixth type is represented by the operculum of *Stegopoma* about which we have already spoken. The difference between the named forms of opercula is really so great, that there can scarcely be any doubt but that they have developed independently, and I shall here point out the significant phenomenon that a number of different forms independently and in different manner have developed a protecting roof to the hydrotheca.

I have already given my reasons why I must regard the presence of an operculum as a family character, and I shall lastly add that if we were to refer all these operculate forms to the *Lafoëidae* we should also be obliged to refer the *Sertulariidae* to the latter family.

A comparison between the diagnoses given above of the two operculate families, the *Campanulinidae* and the *Sertulariidae*, shows that they are very nearly related, and the most significant characters, which distinguish the members of the latter family, are that they are always bilaterally developed, always sessile, and as a rule have a larger or smaller part of the adcauline wall coalesced with the corresponding stem or branch. Further in all the *Sertulariidae*

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[1]) This genus must, no doubt, be united with *Thyroscyphus*.

[2]) 30, p. 380.

the whole roof of the hydrotheca is transformed into the operculum while this within the *Campanulinidae* is only found in *Tetrapoma*, *Thyroscyphus* (with *Parascyphus*) and *Abietinella* n. g.

The interesting species for which I have found it necessary to institute the last named new genus has been described by Jäderholm [1]) under the name of *Zygophylax operculata*. Like a number of nearly related species, referred to the genera *Zygophylax*, *Perisiphonia*, *Brucella* [2]) and *Lictorella*, it possesses short-stalked, bilaterally symmetrical hydrothecae, at their base provided with one or two nematothecae, and the colony consists of an axial tube, which bears at least the great plurality of the hydrothecae, and a number of peripheral tubes. The hydranth is provided with a blind sack, which no doubt is found also in the other related species, but in opposition to the latter the hydrothecae possess quite a similar adcauline operculum to that found in the genera *Diphasia* and *Abietinaria*, being at the same time of a similar form as in the latter genus, and especially presenting a similar neck-shaped narrowing at the adcauline side. In opposition to *Zygophylax* (*Brucella*) *armata* Ritchie, the diaphragm of which is perforated by a large round opening, the diaphragm-opening of *Abietinella operculata* (pl. IV, fig. 22 a) has a similar form to that found in a number of *Abietinaria* species (pl. IV, fig. 22 b), being pear-shaped and surrounded by a projecting margin. If the proximal half of such a hydrotheca were to coalesce with the branch we should find in continuation of the line, indicating the concrescence between the hydrothecal wall and the corresponding wall of the branch, another line running downwards from the adcauline end of the diaphragma and indicating the corresponding concrescence between the stalk and the branch. Such a line, which I shall call the „stalk-mark", we find more or less developed in all the species of *Diphasia* (pl. IV, fig. 26) and *Abietinaria* (pl. IV, fig. 24), and it is distinct evidence that these species must be derived from forms, which have

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[1]) 25, p. 276, Taf. 12 figs. 7—8.
[2]) 50.

been provided with a free stalk. Another species *Zygophylax grandis* Vanh., which must be referred to the same genus, has later been described by Vanhöffen.[1]) Though *Abietinaria* lacks both peripheral tubes and nematothecae the agreement between the species of this group and those of *Abietinella* in the form of the hydrothecae and the structure of the operculum is so great, that I cannot doubt but that the former genus must be derived from the latter. The presence and the development of the nematothecae in the nearly related species, referred to *Zygophylax*, *Perisiphonia* and *Lictorella*, is subject to very great variation, and the same holds good for the composition of the colony, not only in the same form-group, where the peripheral tubes have a very different extension, but also in a number of genera belonging to the *Campanulinidae* and *Sertulariidae*. I have already spoken of the differences in the form of the colony within the genus *Stegopoma*, and I shall still only mention that while the stem in the *Sertulariidae* is monosiphonic, as a rule, a small number of *Sertularella*-species possess a polysiphonic stem. The gonothecae have not yet been found in any of the two *Abietinella*-species, but it is permissible to suppose that they are arranged in the form of a Coppinia, as this arrangement has been found in the related species *Perisiphonia conferta*, *Zygophylax* (*Brucella*) *armata* and in a new species of *Zygophylax* from the Philippine Islands. As the presence of a Coppinia in a freely growing colony seems to be contingent upon the presence of peripheral tubes, the disappearance of the latter might explain the quite different arrangement of the gonothecae in *Abietinaria*, where they as in the great plurality of the *Sertulariidae* are placed in the neighbourhood of the single hydrothecae.

The short-stalked *Thyroscyphus*-species *Th.* (*Parascyphus*) *simplex* Lnx.[2]) *Th. Torresi Busk* (= *Th. simplex* Allm.[3]) and *Th. vitiensis* Markt.[4]) stand in a similar relation to *Sertularella* as

[1]) 50.
[2]) 53, p. 158.
[3]) 5.
[4]) 36, p. 210 and 9, p. 343.

Abietinella to *Abietinaria* and *Diphasia*. They only differ from species of that genus in their hydrothecae being short-stalked, and, therefore, a concretion between the stalk and the corresponding axis would convert them into *Sertulareila*-species.

There has not yet been found operculate short-stalked species, corresponding to the other genera of the *Sertulariidae*, but that such forms have existed is evident from the fact, that a more or less developed stalk-mark is present in most species belonging to this family[1]) When a branch is regarded from one of the sides, this mark as a rule appears as a narrow chitinous process forming a continuation of the inner hydrothecal wall and running either downwards or obliquely inwards, but when we regard a hydrotheca from its inner, adcauline wall we see the whole stalk-mark (Pl. IV, figs. 25, 27) which is provided with a curved or sometimes angularly bent proximal margin, and, therefore, its middle part is much shorter than the two lateral margins seen from the sides of the branch. Sometimes, however, we may also be able to see the whole stalk-mark, when a branch is regarded from the outer surface, f. inst. in *Hydrallmania falcata*. (Pl. V, fig. 7.) In some species, f. inst. in *Sertularia pumila*, *Odontotheca trispinosa* and *Abietinaria Coei* the stalk-mark when regarded from the side has the form of a short coecum-like projection, and in that case the stalk must have been provided with an adcauline concavity, which has prevented it from coalescing with the branch in its whole length. In the two former species it is evident already from an outer inspection that this projection contains an inner cavity (Pl. IV, figs. 13, 15, Pl, V, figs. 11, 14), the presence of which is confirmed by means of a sagittal section through a hy-

[1]) While many authors have seen and figured the stalk-mark I have only found it mentioned by Clarke (15a) and Ritchie (51). Clarke who has seen it in *Sertularia complexa* describes it in the following way: . . .: »chitinous processes extend downwards from the base of each hydrotheca, surrounding an aperture through which the body of the polypite is connected with the cænosarc of the stem.« Ritchie who has seen it in *Sertularia heterodonta* and *S. rathbuni* mentions it in the latter species as »two chitinous processes which project downwards and lie alongside the wall of the internode.«

drotheca. It is however completely closed outwardly. Also in *A. coei* (Pl. IV, fig. 23) a number of the corresponding projections contain a distinct inner cavity, but in most of them it seems to be completely filled by a chitinous secretion.

According to the investigations contained in this paper I must maintain that the *Campanulinidae* have developed from the *Lafoëidae* or partly from the *Campanulariidae*, and that the *Sertulariidae* must be derived from that group of the *Campanulinidae* in which the whole roof of the hydrotheca has been transformed into an operculum.

Thujaria (Fleming) Lev.

The aperture is vertical or obliquely ascending and provided with an abcauline sinus, in which is fixed an opercular membrane, the distal part of which is a free valve.

The gonothecae of the species hitherto examined are smooth without transverse rings and without spines.

In most biserial species the hydrothecae are almost symmetrical, being only in a very slight degree turned towards the frontal face[1]) of the colony.

Of this genus I have examined the following species: *Th. thuja* (L.) *Th. lonchitis* (Ellis & Sol.), *Th. articulata* (Pall.), *Th. lichenastrum* (Pall.), *Th. annulata* Krp., *Th. carica* Lev., *Th. polycarpa* Pöpp., *Th. variabilis* Markt., *Th. cedrina* (L.), *Th. cupressoides* (Lepech.), *Th. sinuosa* Bale, *Th. tuba* (Bale), *Th. desmoides* (Torr.), *Th. hexodon* (Bale), *Th. juncea* (Vanh.), *Th. Hartlaubi* (Nutt.), *Th. Hincksi* (Mer.), *Th. pinnata* (Mer.), *Th. cylindrica* (Clark.).

Sertularia (L.) Lev.

Dynamena (Lamour.)

The aperture is oblique and provided with two lateral teeth, between which there are found a deeper abcauline and a lower

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[1]) »Frontal» we call that face of the colony on which the gonothecae are placed.

adcauline sinus, the latter of which is in most cases divided into two lateral halves by means of a median projection. In each sinus is fixed an opercular membrane, the abcauline of which is in most species provided with a free distal valvular portion.

The gonothecae present a very different habitus, being either smooth, ringed or provided with two or more spines.

In most biserial species the aperture is distinctly turned towards the frontal surface.

In the large plurality of the species the adcauline sinus is divided into two lateral halves by means of a more or less developed median projection. In all such cases the adcauline membrane is at the same time more or less distinctly angularly bent from side to side, the ridge of the membrane rising from the median projection. In all such cases the abcauline membrane is provided with a free, triangular, valvular portion, fitting into the angle formed by the adcauline membrane, and the length of this portion depends on the development of the median projection and the size of the angle in such a manner, that a more developed median projection gives a smaller angle and a longer valvular portion. In such species as f. inst. *S. argentea* L, S. *mirabilis* (Verr.) and *S. Birulae* Schydl.[1]) the median projection and the angular bending of the adcauline membrane are only feebly developed while they are well-developed in *S. pumila* and in all such species, in which the hydrothecae of each pair are contiguous on the frontal side of the colony. Such species are f. inst. *S. Versluysi* Nutt. e. t. c. A still larger development is attained in *S. tubuliformis* (Markt.[2]) in which species the median projection has the same length as the lateral teeth, and the adcauline membrane is at least of the same size as the abcauline. When a closed hydrotheca of such a species is regarded from the side, the ridge of the adcauline membrane forms an obtuse angle with the adcauline wall, and when regarded from the frontal surface its opercular apparatus might seem to be composed of three valves, two adcauline and an

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[1]) 55.
[2]) 36.

abcauline. In such a manner the opercular apparatus of *S. Rathbuni* has been interpreted by Nutting[1]) and Ritchie[2]), and that of *S. heterodonta* by the latter author[2]), but the supposed two distal valves are really only the two halves of the angularly bent adcauline membrane.

I have already pointed out that Nutting regards the opercular apparatus in *Sertularia* as "shaped like the side walls of an "A" tent, the front and rear of the tent being closed by the two opposite hydrothecal teeth", and as a typical example he describes the development and structure of the operculum in *S. pumila*. At the same time, however, Nutting's figures of *S. cornicina*, *S. Mayeri*, *S. brevicyathus* and *S. flowersi* distinctly show that the operculum in these species cannot be constructed in the above manner, the aperture being provided with an adcauline median projection and an angularly bent adcauline wall In such of the author's figures which present the hydrothecae regarded from the side, as f. inst. those of *S. Pourtalesi*[1]) and *S. exigua*[1]), only the one lateral half of the angularly bent adcauline membrane is seen. I have seen, however, a few species, in which the operculum is constructed in the manner described by Nutting, and that is the case in *S. Suensoni* n. sp. (pl. IV, figs. 16—20), *S. grisea* Krp. (= *S. similis* Clark), and in that form which Marktanner-Turneretscher[3]) has described under the name *S. diffusa* Allm., var. To judge from the figure given by the author *Sertularia (Sertularella) Clarki* Mer. seems to have a similar operculum. In these species the adcauline sinus has no median projection, the adcauline membrane is not angularly bent, and both opercular membranes, which have an almost straight free edge, form with each other an acute angle. An adcauline median projection and an angular bending of the adcauline wall we also lack in *S. Nuttingi* n. sp. (pl. IV, figs. 1—4) in which the bottom of the sinus is convex and the adcauline membrane very short. The same

[1]) 44.
[2]) 51.
[3]) 36.

is the case in the nearly related species *S. intermedia* (pl. IV, figs. 7—10) in which, however, the lateral teeth are less developed, and the adcauline membrane only indistinctly defined from the rest of the adcauline wall. I must regard both species as intermediate forms between *Thujaria* and *Sertularia*, and I cannot doubt but that the latter genus has developed from the former by a transformation of the distal part of the adcauline wall.

Sertularia Suensoni n. sp.

(pl. IV, figs. 16—20).

The colony, the height of which is 67 mm, has a thin, but rather rigid geniculate stem, which increases in thickness towards the tip, and is divided into distinct internodes, each of which bears a branch. The branches, which rise from the stem at an angle of about 70°, present a spiral arrangement, the sixth being placed over the first. They are regularly and richly dichotomously branched, each being divided 7 times, and, therefore, they form a very dense tuft, which in the colony examined takes up the distal half, the branches in the proximal half being only represented by a few proximal internodes. The internodes of the branches bear 5—13 hydrothecae.

The hydrothecae, the length of which is c. 0,5 mm, are alternate or subalternate, provided with a short free, obliquely ascending, not outwardly curved distal end, and divided from each other by interspaces which increase in length towards the end of the branches, where they may attain the length of a hydrotheca. The aperture, which is turned a little towards the frontal surface of the colony and is provided with two large, triangular lateral teeth, has a concave adcauline sinus without a median projection, and the adcauline membrane, which is not angularly bent and slopes a little outwards has an almost straight free edge, which meets the corresponding edge of the abcauline membrane at an angle of c. 50°. In opposition to what is found in the large plurality of *Sertularia*-species the abcauline membrane, therefore, has no free valvular

portion, and the egress of the hydranth takes place only through the fissure between the edges of the two membranes. In this species, therefore, the opercular apparatus is formed as the walls of an "A" tent.

A single colony was taken at lat. 42° N, long. 130° 30′ E. by Capt. E. Suenson. Depth 60 fathoms.

This species is nearly related to *S. Fabricii* Lev. which also lacks a median adcauline projection, but in the latter species the adcauline membrane is not sloping outwards, and being, besides, slightly convex from side to side the abcauline membrane is provided with a feebly developed free valvular portion.

Sertularia decipiens n. sp.

(Pl. IV, figs. 11, 12).

The colonies, the largest of which attains a height of 22 mm, are singly pinnate with alternate branches, and the stem is divided into regular internodes, each of which as a rule bears a single branch. An exception is found in the lowermost branchiferous internode which always bears two opposite or subopposite branches, and in a small number of the colonies examined the same is the case with still another internode, in a single colony even with two. While the furrows dividing the single internodes from each other are as a rule sloping very little towards the frontal surface of the colony, those bounding the proximal end of the internodes with two branches are very different from the others, being very long and deep and the two lateral halves of each forming with each other two acute angles of about 35°—40°, a distal on the dorsal and a proximal on the frontal surface of the colony. The lowermost non-branchiferous portion of the colony has the length of 3—4 internodes, and as a rule is not divided into distinct internodes, but in a small number of the colonies the distal end presents 1—2 short internodes, the proximal end of which is bounded by similar characteristic furrows as those above mentioned. The branches, of which the largest colonies bear 8—9 on each side,

are divided into internodes of different length, each bearing 1—4 pairs of opposite hydrothecae, and as a rule the internodes of the proximal half of the branch have a larger number of hydrothecae than those of the distal half, in which, therefore, most of the short internodes are found.

The hydrothecae, which are placed on the frontal side of the colony, are adnate to the stem and the branches with a portion of their adcauline wall which rarely attains the half length of the latter. Besides, the hydrothecae of each pair are contiguous in the two thirds of their length and the single pairs of hydrothecae belonging to the same internode are connected with each other in such a way, that a larger part of the adcauline wall of a proximal hydrotheca is adnate to a smaller part of the abcauline wall of a distal hydrotheca. They are elongately vase-shaped, and their free distal ends are turned obliquely outwards, those belonging to each pair of hydrothecae forming with each other an angle of c. 70°. The aperture is twice as broad as high and provided both with well-developed lateral teeth and with a well-developed median projection, which divides the adcauline sinus into two lateral halves. There is found a well-developed, outwards sloping, angularly bent adcauline membrane.

Each branchiferous internode of the stem is provided with a pair of subopposite hydrothecae, which in the proximal part of the stem are divided from each other by an interstice, the breadth of which gradually decreases distally according to the decreasing breadth of stem, and at last they coalesce with each other in a similar way as in the branches. Sometimes this coalescence may take place already in the fourth internode, sometimes not before the seventh. Besides there is found a single hydrotheca distally to each branch. In most colonies more or less of the proximal stem internodes have lost their hydrothecae which, however, have left distinct traces of their presence.

Of this species I have seen 70 colonies which rise from an interlacing stolonic network, fixed to a worm-tube. Paumben (India). Depth 1 fathom. (C. Fristedt).

Both the form of the hydrothecae and their unilateral arrangement give to this species a great outer resemblance to *Hydrallmania falcata*.

Sertularia Nuttingi n. sp.

(Pl. IV, figs. 1—4).

The colonies, the largest of which has a height of 117 mm, have a thin slender stem, which is as a rule only indistinctly divided into internodes, but in some of them the internodes of the distal part are rather distinct and each provided with 3 branches. In the youngest colony, which has a height of 50 mm. and is provided with 15 pairs of alternate branches, the stem has very distinct internodes which are provided with 4—8 branches. We can discern in the colony between a proximal, somewhat longer part, in which the branches are simple and alternate, and a distal part, the branches of which are composite and spirally arranged, the sixth being placed over the first. The latter branches are provided on each side with 1—3 alternate branchlets, a few of which may rarely be bifurcate. The branches diminish in length towards the end of the branch, and as they have their ends lying in the same circle-segment these branches look as if they were flabellate. The simple branches and the longest branchlets are only divided into two, rarely three internodes.

The hydrothecae, which are alternate, show some difference in the proximal and in the distal portion of the colony, being in the former wholly adnate and provided with an almost vertical or very little ascending abcauline wall, while in the latter they have a very short, free distal end and a distinctly ascending abcauline wall. While further the single hydrothecae in the former are nearly approximate, they are in the latter divided from each other by an interstice which may attain the half length of the hydrotheca. The above differences, however, are not equally large in all colonies, and, besides, there may be found some difference also between the hydrothecae in the proximal and those in the

distal part of the branches. The aperture, which is turned a little outwards and frontally, is provided with two well-developed roundedly triangular lateral teeth and lacks an adcauline median projection. The bottom of the adcauline sinus is convex, and the short adcauline membrane is convex from side to side.

The gonothecae are pyriform, smooth, and the short annular aperture is surrounded by 6—8 short spines.

Of this species I have seen 8 colonies from Japan (33° 10′ N. 129° 18′ E.), depth 33 fath. (Schönau).

Sertularia intermedia n. sp.

(Pl. IV, figs. 7—10).

The colony, which has a height of 95 mm. is provided with a thin slender stem, presenting a number of indistinct internodes with 6—12 branches. It is divided into a proximal half with simple alternate branches, and a distal half, the branches of which are spirally arranged and composite, each being provided on each side with 3—5 branchlets, which gradually decrease in length towards the tip, and, therefore, these branches give the impression of being flabelliform.

The hydrothecae which are alternate and divided from each other by an interstice, which may attain the length of a half hydrotheca, are in the whole length of the colony provided with a distinctly obliquely ascending and gracefully outwards curved abcauline wall, and with a rather short free distal end. The aperture which is turned directly towards the margin of the colony, is provided with two broadly rounded, but low lateral teeth, and with a convex or indistinctly angularly bent adcauline wall, the membranous portion of which is very low and indistinctly defined.

The gonotheeae are pyriform, and the short ring-shaped aperture is surrounded by 6—8 short spines. Besides the above described mature colony there are found two small (height 32—

40 mm) pinnate ones, provided with 12—15 pairs of alternate branches.

From the Korea-Strait (Capt. E. Suenson). Depth 50 fath.

Hydrallmania (Hincks) Lev.

The aperture is provided with two lateral teeth between which are found a deeper adcauline and a much lower abcauline sinus, which is not divided by a median projection. The opercular apparatus is formed by a much larger adcauline and a small abcauline membrane, the former of which is provided with a free valvular portion (Pl. V, figs. 1—7).

I have already pointed out[1]) that the characters on which Hincks has instituted the genus *Hydrallmania* are only of specific value, and, therefore, the question if the genus has a right to stand depends on whether the aperture and the opercular apparatus present sufficiently great differences from those found in the other genera. The above diagnosis shows that the aperture may be regarded as an inverse *Sertularia*-aperture, and, therefore, there may be set forth reasons both pro and contra the independence of the above genus, which, for the present I propose to keep. Besides the three species, *H. falcata* L., *H. distans* Nutt.[2]) and *H. fransiscana* Trask[2]), all of which have their bases placed in the same longitudinal belt and only differ from each other in minor details regarding the form and mutual position of the hydrothecae, I must to this genus still refer the species which Allman has described as *Thujaria plumulifera*.

Hydrallmania plumulifera (Allman).

Thujaria plumulifera Allman, Memoirs Mus. Comp. Zoology Vol. V, No. 2, Cambridge 1877, p. 27, pl. XVII, figs. 3—6.
— — Jäderholm, Bihang till K. Svenska Vetensk. Akadem. Handl. B. 21, Afd. IV, No. 6, 1896, p. 12, Taf. II, fig. 4.

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[1]) 33.
[2]) 44.

non *Thujaria plumulifera* Nutting, The Sertularidae, p. 67, pl. IX, figs. 9—13.

(Pl. V, figs. 1—6).

The colony is provided with an extremely thin and slender stem, divided into distinct internodes, each of which bears a branch, but while a number of the proximal branches are alternate, simple, and rather short (length 8—10 mm), the rest of the branches, which are borne by very long internodes, are spirally arranged, much longer (19—30 mm) and each provided with 4—7 pairs of alternate branchlets. Their axes are like the main-stem divided into distinct internodes, a few of which may be without branchlets.

The hydrothecae, which are provided with a convex adcauline and a somewhat concave abcauline lateral margin, are turned outwards and more or less frontally, but in opposition to what is the case in *H. falcata* (Pl. V, fig. 8) not only their distal ends, but also their bases are in the single branchlets arranged into two distinct longitudinal series, and the single hydrothecae of a branchlet either do not touch each other at all or only in a very small degree, a small proximal and adcauline portion of a distal hydrotheca being in connection with or covered by a proximal one. For the rest they are very like those of *H. falcata*, and their distal fourth is freely projecting.

The distance between the hydrothecae of the two series as also their direction varies according to their place in the branchlet, in such a way that the more proximally the hydrothecae are placed the greater is the distance between the two series, and the less distinct is the frontal turning of the hydrothecae. A corresponding difference is also contingent upon the more or less proximal or distal position of the branchlet in the branch, and of the branch in the stem, and, therefore, the distance between the two series of hydrothecae attains its maximum in the proximal part of the proximal branches, and here the frontal turn of the hydrothecae is almost imperceptible. A line dividing one of these branchlets into two lateral halves, in the distal end only cuts off a small

adcauline portion of the diaphragms. Each branchlet is divided into 3—6 internodes, each of which bears 3—10 hydrothecae, the number of the latter in each internode decreasing as a rule towards the distal end. In the stem as also in the axes of the composite branches the hydrothecae are arranged into two well-divided longitudinal series, but while the internodes of the proximal portion of the stem bear 3 hydrothecae those of the distal portion are only provided each with a single one, placed at the origin of the branch. The axial internodes of the composite branches bear 3—6 hydrothecae.

The gonothecae, of which I have seen a few borne by the stems and by the proximal part of a number of branchlets, are elongate, smooth, from the middle decreasing in thickness towards both ends, the distal of which is somewhat tubiform.

Georgia from off the mouth of the river Savannah. Depth 4 fathoms.

I have examined two incomplete colonies sent me from the Zoological Museum of Upsala[1]).

Allman's short and incomplete description as also his accompanying figures agree very well with the present species, and the only disagreement is that according to Allman "the hydrothecae are adnate for nearly their whole length", but this difference may very well be the result of variation. The author especially points out that "*Thujaria plumulifera* has a good deal of the habit of *Hydrallmania falcata*." On the other side Nutting's species, of which he has sent me some fragments, is not identical with Allman's. It is a *Sertularia*, the hydrothecae of which are provided with a rather long, free distal portion and have the adcauline sinus feebly divided into two lateral halves. In opposition to what is the case in *H. plumulifera* there is no spiral arrangement of the branches, and the internodes which are not sharply divided from each other and each of which bears a branch, are of very unequal length, each bearing 3—15 hydrothecae.

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[1]) I have later received a fragment of the original specimen from the Museum of Comp. Zoology, Cambridge.

I propose to name this species, the examined fragments of which are from the Albatross' station 2015, **Sertularia extensa** n. sp.

In some young colonies of *H. falcata* from Hellebaek, Denmark, which have a length of 29 mm I have also found a proximal portion with shorter internodes and provided with 8—13 pairs of rather short alternate branches, but these internodes differ from the corresponding in *H. plumulifera* therein, that they are only provided each with an axillary hydrotheca. In the youngest of these colonies the distal portion, which bears a few rudimentary branches, has a length of 10 mm.

To the present genus may perhaps still be referred *Sertularella limbata* Allm. [1]).

Odontotheca n. g. [2]).

The aperture is provided with two strongly developed, sometimes unequal abcauline teeth, between which there are found a much larger and deeper adcauline and a much smaller abcauline sinus. In each sinus is fixed a thin opercular membrane, which ends in a straight edge, and, therefore, lacks a free valvular portion. In a few cases there is found a median adcauline tooth, and in such species (f. inst. in *O. trispinosa* Cought) the adcauline membrane is angularly bent, and the abcauline provided with a free valvular portion. The gonothecae have a very variable habitus, being either smooth, ringed or provided with two spines.

To this genus I must refer the following species: *Sertularia operculata* L. (22.), *S. aperta* Allm. (4.), *S. minima* d'Arcy Th. (4.), *S. unilateralis* Allm. (4.), *S. crinis* Allm. (4.), *S. crinoidea* Allm. (4.), *S. megalocarpa* Allm. (4.), *S. bispinosa* Gray (7.), *S. Maplestonei* Bale (7.), *S. macrocarpa* Bale (7.), *S. pulchella* d'Arcy Th. (7.), *S. bidens* Bale (7.), *S. trispinosa* Cought (7.), *Sertularella trochocarpa* Allm. (4.), *Sert. episcopus* Allm. (2.), *Sert. rectitheca* Ritchie (50.), *Thujaria ramosissima* Allm. (4.), *Th. plumosa* Clark (44.) and *Abietinaria greenei* (Clark) (44.).

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[1]) 4. [2]) Pl. V, figs. 8—15.

I have only been able to examine the opercular apparatus of *Sert. operculata* (Pl. V, figs. 8—10) and *Sert. trispinosa* (Pl. V. figs. 11—15), but the form of the aperture in the above species leaves no doubt that they must be referred to the same genus. In *Thujaria bidens* Allm. (2.) the aperture seems to be an inverted *Odontotheca*-aperture, and this species must, therefore, no doubt, be referred to a new genus.

Diphasia (Agassiz) Lev.

The aperture, which is horizontal or very little oblique, has no teeth and is provided with an adcauline sinus in which is fixed an opercular membrane with a large free opercular valve.

The above genus not only comprises most species referred to *Diphasia* but also those belonging to *Abietinaria* Kirchenpauer, a genus based solely on the form of the hydrothecae which have been characterized by the author in the following manner: „es sind flachenförmige, bauchige, mit ihrer Basis angewachsene Behälter, deren nach aussen gerichtete Öffnung das Ende eines engen, mehr oder weniger langen, nach einer Seite geliegenen Halses bildet.“ Nutting who accepts *Abietinaria* as an independent genus next to *Diphasia* characterizes it not only by the form of its hydrothecae ("more or less bottle-shaped') and gonothecae, but also by the presence of an adcauline operculum, while Broch[2]) proposes to divide the genus *Diphasia* into two subgenera. *Eudiphasia* and *Abietinaria.* As both the form of the hydrothecae and the structure of the gonothecae are subject to great variation, and the same forms of hydrothecae and of gonothecae are found in a number of different genera, I cannot regard *Abietinaria* as a distinct genus, and I think that we may, at least provisionally, accept Broch's proposition to divide *Diphasia* into two subgenera or groups.

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[1]) 28.
[2]) 13.

Group **Eudiphasia** (Broch).

The hydrothecae increase in breadth towards the distal end, and attain their largest breadth at the aperture. The gonothecae are always provided with a number of projections (leaves, spines), of different form and size, either placed in the distal end or spread over a larger portion of the gonotheca.

To this group belong the following species: *D. rosacea* (L.) (22.), *D. attenuata* Hincks (22.), *D. fallax* (Johnst.) (22.), *D. Wandeli* Lev. (32), *D. pinaster* (Ell.-Sol.) (22.), *D. pinnata* (Pall.) (22.), *D. alata* Hincks (= *Thuj. pharmacopola* Allm.) (22.), *D. paarmani* Nutt. (44.), *D. palmata* Nutt. (45.), *D. tropica* Nutt. (44.), *D. bipinnata* Allm. (4.), *D. scalariformis* Kirkp. (29.), *D. mutulata* (Busk) (7.), *D. digitalis* (Busk) (7.) = *Desmoscyphus acanthocarpus* Allm. (5.) and possibly *Thuj. heteromorpha* Allm. (4.).

Group **Abietinaria** Kirchenp.

The hydrothecae decrease in breadth towards the distal end, and the breadth of the aperture is smaller — as a rule much smaller — than the largest breadth of the hydrotheca. The gonothecae are smooth or ringed, and rarely provided with two spines.

Besides the 10 species, referred by Kirchenpauer to his genus *Abietinaria*, I also refer the following species to this group: *A. coei* Nutt. (44.), *A. Traski* Torr. (44.), *A. amphora* Nutt. (44.), *A. gracilis* Nutt. (44.), *A. costata* Nutt. (44.), *A. annulata* (Krp.) (44.), *A. turgida* (Clark) (44.), *A. gigantea* (Clark) (44), *Diphasia Kincaidi* Nutt. (44.), ? *D. pulchra* Nutt. (44.), (= *Dynamena unilateralis* Bonnevie (12, p. 78), *Thuj. thujarioides* (Clark) Nutt. (44.) and *Sertularia* (*Selaginopsis*) *fusca* Johnst. (= *Th. salicornia* Allm.) (1.). Lastly I shall set forth some few remarks on the structure and synonymy of a number of the above species.

In a number of them I have found an internal, median, adcauline tooth-shaped projection of different form and size, which is placed a little proximally to the free edge, and only seems to be present in such forms in which there is a well-developed ad-

cauline collar-like narrowing. This projection has been found in *A. Tilesi*, *A. melo*, *A. costata*, *A. juniperus*, *A. filicula*, *A. coei*, (Pl. IV, fig. 22), *A. gracilis* and in those forms which Kirchenpauer has designated as *A. abietina*, var. *minor*, *A, abietina*, var. *purpurea* and *A. filicula*, var. *tornata*.

In *A. Traski* the diaphragm is on each side provided with a triangular, pointed, ascending portion.

Thujaria salicornia Allman, [1]) which, as far as I know, has not been mentioned since it was described, is identical with *Sert. fusca* Johnst., and the reason why this fact has not been earlier detected is, no doubt, that the hydrothecae look very different in the figures given by Hincks and in those given by Allman. The pinna figured by Hincks is namely seen from one of the broad sides, while the two pinnae figured by Allman are seen from one of the narrow sides.

Broch regards *Diphasia pulchra* Nutt. as a synonym to *Thuj. thujarioides* (Clark), and the two forms, which have quite similar gonothecae, are no doubt nearly related, but a comparison between specimens of both has led me to the result, that they must be regarded as distinct species. I shall here only point out that in *A. pulchra* the very short free distal portion of the hydrothecae, which is provided with an adcauline collar-like narrowing, is only by a very narrow interspace divided from the adjacent portion of the branch, while in *A. thujarioides* the much longer distal portion has no narrowing and is divided from the stem by a rather broad and deep sinus.

The abcauline wall of *Diph. digitalis* (Busk) presents a feebly developed membranous collar, and, therefore, the aperture is provided with two feeble lateral teeth.

Sertularella (Gray) Hincks.

The aperture is provided with 3—4 marginal teeth, between which are found as many curves. In each curve is fixed an opercular membrane provided with a large free, valvular portion.

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[1]) 1, p.

In the large plurality of species the gonothecae are ringed, and with the exception of a single species (*S. tamarisca*) the hydrothecae are regularly alternate.

As in most genera the form and direction of the hydrothecae are subject to great variation, but in opposition to what is found in more or fewer species of all the other genera, the turning of the hydrothecae towards the frontal surface of the colony is never so strong that the hydrothecae of the two opposite series come in contact with each other, and this cannot be regarded as a consequence of the alternate arrangement of the hydrothecae, as such a coalescence is found both in *Hydrallmania* and in *Idia*, the hydrothecae of which are alternate.

In opposition to what is found in all other genera with many species the arrangement of the hydrothecae is exceptionally constant, opposite hydrothecae having hitherto only been found in *S. tamarisca*.

In respect to the extent in which the hydrothecae are adnate to the respective axis *Sertularella* is the only genus, in which a number of species have their hydrothecae only affixed by their bases (*S. quadrata* Nutt., *S. catena* Allm., *S. cylindritheca* Allm., *S. magna* Nutt.), and, besides, in a large number of species the adcauline wall of the hydrothecae is only adnate in its proximal third or fourth (f. inst. in *S. areyi* Nutt., *S. amphoriformis* Nutt., *S. fusiformis* Hincks, *S. tricuspidata* (Alder) e. t. c.), a condition which outside the genus *Sertularella* has only been found in a few species of the subgenus *Abietinaria*. Only in a few species (*S. lata* Bale, *S. distans* Allm., *S. albida* Krp.) are the hydrothecae adnate in their whole length.

Corresponding primitive conditions are also presented by some species in the structure of the diaphragma, and by others in the composition of the colony.

While all other members of the family seem to possess a complete diaphragma perforated by a narrow abcauline, pearshaped or ovate opening, the diaphragma in a number of *Sertularella*-species

is more or less incomplete, and in *S. lata* (Bale) and *S. distans* Allm. it is quite absent, being only represented by the somewhat thickened proximal edge of the adcauline hydrothecal wall. In *S. magna* Nutt. and *S.* (*Thecocladium*) *flabellum* Allm. it is only developed as a narrow adcauline belt, while in *S. qvadrata* Nutt. and *S. cylindritheca* Allm. a corresponding belt is found in the whole circumference of the hydrotheca. It is broader in the dorsal than in the frontal surface of the colony, and, in the old hydrothecae of the stem I have found it closed with the exception of a round or pear-shaped opening. In a number of species I have found the diaphragma perforated by an unusually large rounded opening, for inst. in *S. pinnata* Clark, *S. tricuspidata* Alder, *S. fruticolosa* Til., *S. Tilesii* Krp., und *S. infracta* Krp. A large ovate opening is found in *S. tamarisca.*

While a fascicled stem is so common a feature in the *Lafoëidae,* the *Campanulariidae* and the *Campanulinidae,* it very rarely occurs in the *Sertulariidae* outside the genus *Sertularella,* namely in *Diphasia alata* Hincks. "*Thujaria*" *diaphana* Allm., *Thujaria bidens* and *Sertularella cuneata* Allm.; but it has been found in the following *Sertularella*-species: *S. gayi* (Lmx.), *S. megastoma* Nutt., *S. catena* Allm., *S. pinnigera* Hartl., *S. tropica* Nutt., *S. pluma* Krp., *S. arborea* Krp., *S. crassicaulis* Heller. *S. antarctica* Hartl. *S. annulata* Allm. and *S. crassipes* Allm.

Short-stalked hydrothecae have been found in the creeping *Sert.* (*Calamphora*) *parvula* Allm.,[1]) and in a form which Hartlaub has provisionally designated as *Sert. tenella* (?).[2]) I think the hydrothecae of the latter are much more like those of *Sert. Areyi* Nutt.[3]).

The above facts, therefore, seem to show that *Sertularella* is the most primitive genus in the family *Sertulariidae.* Lastly, we must still mention that though the large plurality of the gonothecae in *Sertularella* are ringed, the two other forms, which have been

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[1]) 5.
[2]) 19, p. 64, pl. V, fig. 24.
[3]) 44, p. 83.

found in most genera, namely, the smooth and the spinous ones are also represented in this genus. Hartlaub names five species, in which the gonothecae are smooth while spinous gonothecae have only been found in *S. quadrata* Nutt., *S. turgida* (Trask) and *S. tamarisca*.

As the large plurality of the *Sertularella*-species are provided with a stalk-mark, there can be no doubt that they have developed from stalked forms, and as the hydrothecae in the genus *Thyroscyphus* are provided both with a stalk and with a *Sertularella*-operculum, it is permissible to suppose that a large number of these ancestral forms have been short-stalked *Thyroscyphus*-species. I have found the gonothecae of *Th. ramosus* Allm. and *Th. Torresi* Busk, in which two species they are indistinctly ringed, and therefore they present no difficulty to such a supposition. Neither does the diaphragma, which is developed as a marginal thickening in the whole circumference of the hydrotheca and, therefore, corresponds to the thickened marginal portion of the diaphragma found in most *Sertularella*-species. But such species as *S. lata* (Bale), *S. distans* Allm., *S. magna* Nutt. and *S. flabellum* (Allm.), in which the diaphragma is either quite absent or only represented by a narrow adcauline belt cannot have developed from *Thyroscyphus*, and the same, no doubt, holds good also for the earlier mentioned group of species, the cylindrical hydrothecae of which are free in their whole length, but quite lack a stalk-mark. To *Sertularella* have also been referred a small number of species provided with free cylindrical hydrothecae, but without an operculum, namely "*Sertularella*" *integritheca* Allm., "*Sertularella*" *formosa* Fewkes and "*Sertularella*" *Hartlaubi* Nutt. In "*S.*" *integritheca*, the only one of the three species, which I have been able to examine, the diaphragma has a somewhat similar structure as in "*S.*" *cylindritheca*, and I am inclined to think, that the same is the case, with the two other species. I cannot refer the three species to *Sertularella* as they lack the chief character of this genus, but it is possible that the *cylindritheca* group may have developed from the

integritheca group by the transformation of the hydrothecal roof into an operculum. In either case I cannot doubt but that *Sertularella* is a polyphyletic genus.

Idia Lamouroux.

(Pl. V, figs. 18—22).

The obliquely ascending aperture is surrounded by two very thin lips, which are bordered on each side by a small tooth, and are provided with a very much convex free margin. While the presence of an abcauline opercular membrane is only faintly indicated on each side by the bounding of the lateral tooth, there is found a large, well-defined adcauline sinus, which is divided into two lateral halves by a well-developed median tooth, and the adcauline opercular membrane, which is provided with a median fold and with a free valvular portion, is in opposition to the abcauline lip very movable.

In the only species hitherto known the two series of subalternate hydrothecae are with the exception of the outwards bent distal ends, in the pinnules (but not in the stems) adnate to each other along the frontal surface of the colony. The gonothecae are urn-shaped, and with the exception of the short broad aperture their surface is divided into a number of longitudinal belts.

In the structure of the hydrothecal margin and the opercular apparatus this genus presents the greatest likeness to *Hydrallmania*, but it differs from this genus in the possession of a median adcauline tooth, and therein that an abcauline opercular membrane is only faintly indicated by the abcauline bounding of the lateral teeth.

Also in the possession of subalternate hydrothecae, and in the more or less extensive coalescence, which takes place between the two opposite series, the species of *Hydrallmania* show likeness to *Idia pristis*.

Allman[1]) who has misunderstood both the structure of the

[1]) 5.

opercular apparatus, and the composition of the colony has referred the genus *Idia* not only to an independent family, but also to a new section *Thalamophora*. A correct description of the colony has been given by Bale[2]), and Billard[3]) has pointed out the presence of an adcauline operculum.

Plate IV.

Fig. 1. *Sertularia Nuttingi* n. sp. Hydrothecae from the distal portion of the colony. Frontal surface. × 57.
— 2. The same species. Distal portion of the colony. Dorsal surface. × 47.
— 3. The same species. The distal end of a hydrotheca, seen from the frontal surface. × 66.
— 4. A gonotheca of the same species. × 34.
— 5. The distal end of a hydrotheca of *Sert. Fabriçii* Lev., seen from its frontal surface. × 47.
— 6. The distal end of the same hydrotheca, seen from the side. × 47.
— 7. *Sertularia intermedia* n. sp. Hydrothecae from the distal portion of a colony. × 34.
— 8. The same species. The distal end of a hydrotheca, seen from its frontal surface. × 66.
— 9. The same species. The one side-half of the distal end of a hydrotheca, extended. × 66.
— 10. A gonotheca of the same species. × 34.
— 11. *Sertularia decipiens* n. sp. A portion of a branch, seen from the side. × 20.
— 12. The same species. A portion of a branch. Front view. × 20.
— 13. *Sertularia pumila* L. A pair of hydrothecae showing distinct stalks, and distally to each of them a translucent inner cavity. Trondhjem-fiord. × 34.
— 14. The same species. Frontal view of the end of a hydrotheca × 66.
— 15. The same species. Longitudinal section through a portion of a hydrotheca showing the stalk and the inner cavity between the latter and the hydrotheca. × 47.
— 16. *Sertularia Suensoni* n. sp. A portion of a branch. Front view. × 34.

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[2]) 7.
[3]) 9.

Fig. 17. The distal end of a hydrotheca from the abcauline surface. × 66.
— 18. The distal end of a hydrotheca from the adcauline surface. × 66.
— 19. The distal end of a hydrotheca showing the "A"-tent, formed by the two opercular membranes.
— 20. The "A"-tent seen from above. × 66.
— 21. *Abietinella operculata* (Jäd.). × 34.
— 22 a. The diaphragm of the same species. × 66.
— 22 b. The opening of the diaphragm in *Abietinaria Traski*. × 66.
— 23. A hydrotheca of *Abietinaria coei* Nutt. showing the stalk-mark and the adcauline internal tooth. × 34.
— 24. A hydrotheca of *Abiet. abietina* L. showing the stalk-mark. × 20.
— 25. Two hydrothecae of *Abiet. variabilis* after their abcauline projecting portion has been cut away. Distally is seen the boundary line of the adcauline hydrothecal wall, and proximally the diaphragm, the aperture of which is surrounded by a projecting margin, and the stalk-mark. × 20.
— 26. A hydrotheca of *Diphasia pinaster* L, with stalk-mark. × 20.
— 27. A hydrotheca of the same species after its abcauline projecting portion has been cut away. Proximally are seen the stalk-mark and the diaphragm.
— 28—29. *Sertularella magna* Nutt. The distal end of a hydrotheca seen from the opposite sides. × 66.

Plate V.

Fig. 1. *Hydrallmania plumulifera* Allm. A portion of a proximal branch. Dorsal view. The hydrothecae, which show distinct stalk-marks, have been regenerated. × 34.
— 2. The same species. A portion of a distal branch. Frontal view. × 34.
— 3. The same species. A portion of a distal branch. Lateral view. Distinct stalk-marks. × 34.
— 4. The distal end of a hydrothecae, seen from the abcauline surface. × 66.
— 5. The distal end of a hydrotheca, seen from the side. × 66.
— 6. The distal end of a hydrotheca, seen from the adcauline surface. × 66.
— 7. *Hydrallmania falcata* (L,). A portion of a branch. Lateral view. Distinct stalk-marks. × 34.
— 8. *Odontotheca operculata* (L.). A portion of a branch. Frontal view. Distinct stalk-marks. × 34.
— 9. The same species. The Distal end of a hydrotheca, seen from the abcauline surface. × 66.
— 10. The distal end of a hydrotheca, seen from the adcauline surface and partly from above. The translucent abcauline sinus is seen. × 66.

Fig. 11. *Odontotheca trispinosa* Cought. A pair of hydrothecae, seen from the frontal surface of the branch. The stalk-mark shows a translucent inner cavity. × 47.

— 12—13. The same species. The distal end of a hydrotheca, seen in two slightly different positions, but mainly from the adcauline surface and partly from above. In fig. 13 is seen the translucent abcauline sinus. The line springing from the adcauline tooth indicates the ridge of the angularly bent adcauline membrane. × 66.

— 14. An optical longitudinal section of a hydrotheca showing the inner cavity of the stalk-mark. × 75.

— 15. The same species. A hydrotheca seen from the abcauline surface. Distally is seen the abcauline opercular membrane. For the rest compare with Pl. IV, fig. 24. × 47.

— 16. A gonotheca of *Hebella contorta* Markt. × 34.

— 17. The same gonotheca seen from the distal end. × 34.

— 18. *Idia pristis* Lmx. A portion of a branch seen from the frontal surface. Near to the distal end of each hydrotheca is seen the fold of the adcauline opercular membrane (also seen in the other figures). × 34.

— 19. The same species. Dorsal view. Distinct stalk-marks. × 34.

— 20. The same species. A somewhat oblique longitudinal section, which has cut away the distal ends of the one series of hydrothecae. Distinct stalk-marks. × 34.

— 21. The same species. The distal end of a hydrotheca, seen from the adcauline surface. × 66.

— 22. The same, seen from the abcauline surface. The presence of a special abcauline opercular membrane is only faintly indicated. The adcauline sinus with its median projection is seen through the thin wall. × 66.

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14.—2.—1913.

A new species of Hilara.

By

William Lundbeck.

Hilara anglodanica n. sp.

Male. Vertex and frons velvet black, above the antennæ a greyish or brownish grey triangle, reaching about to the ocellar tubercle. Epistoma brownish; palpi greyish, with long hairs, among which especially one long bristle. Occiput dark grey, with somewhat long, black hairs. Antennæ black, the style fully as long as the third joint. Thorax grey pruinose, only very slightly shining; it is lightest when seen from in front; between the acrostichal and dorsocentral bristles there is on each side a not very distinct, slightly brownish stripe, sometimes almost not perceptible. The dorsocentral and acrostichal bristles of some length, black, the former uniserial, longest behind and especially the last is long; the acrostichal bristles regularly quadriserial. Further a humeral bristle, a posthumeral (or præsutural), three notopleural, about four supraalar bristles, but only the hindmost long, the two anterior placed besides each other and small, finally a postalar bristle; anteriorly in the præsutural depression are some small hairs. Scutellum grey, with four long bristles, the median pair longest. Pleura grey or dark grey pruinose. Abdomen a little narrowed towards the end, black, very thinly greyish pruinose and somewhat shining; it is generally slightly translucently brownish at the base. It is clothed with short, black hairs, and has rather long, but fine hindmarginal bristles. Venter similarly coloured, but quite dull, and with quite short hairs. Exterior genitalia not large, distinctly grey

pruinose; the lamellæ black, shining, with rather dense, black hairs; they are cleft at the apex. Legs black, a little dark greyish pruinose, the coxæ most distinctly; the knees very narrowly reddish, most distinctly on the hind knees. Front femora with a little longish hairs on the posterior side; middle femora with a row of bristly hairs on the anterior side, longest at base and apex; hind femora with longish hairs above and below, longest below towards the apex and here almost bristly; front tibiæ with fine hairs above, being longest and bristly towards the base, and with rather dense hairs on the posterior side; middle tibiæ mainly short-haired, with a bristle at the base on the anterior side and one below about one third from the apex; hind tibiæ with a dorsal and anterior row of somewhat long bristles, and short-ciliated below. Front metatarsus cylindrical, a little spindle-shaped, somewhat thickened and somewhat thicker than the end of tibia; it is three fourth of the length of tibia and somewhat longer than the other four joints; it is densely short-haired below and a little longer haired above, and here generally with two longer hairs, one near the apex and another in or more or less above the middle; all tarsal joints are longer than broad, the fourth joint on the middle tarsi is the shortest. All hairs on the legs are black or blackish. Wings a little brownish tinged; veins black or brownish black; the upper branch of the cubital vein issuing almost rectangularly, after the curve it is nearly straight and a little diverging; anal vein fine and pale, disappearing somewhat before the margin. Stigma brown or blackish brown, long, its inner end nearly opposite to the medial cross-vein. Halteres black, the peduncle brown, especially towards the base.

Hilara anglodanica ♂, front leg. × 30.

Female. Similar to the male; the front metatarsus simple,

fully half as long as tibia, but not so long as the four following joints; the whole tarsus a little longer than the tibia; hind tibiæ quite simple.

Length. The species may vary somewhat in size, from 3,5 to nearly 5 mm., the female is smallest.

Not quite mature specimens may have the legs, especially the front legs, somewhat brownish, and the base of abdomen more translucently brown.

This species seems to be somewhat nearly related to *H. dimidiata* Strobl (according to the description), but it is distinguished by several characters, among others a different coloration of thorax and distinct marginal bristles on abdomen; also the front legs are differently constructed; the female is at once distinguished by the quite simple hind tibiæ. It may also remind one of *H. lurida* Fall., but the male has thicker front metatarsi and both sexes are distinguished by the quite regular quadriserial acrostichal bristles. — Among the Danish species it will be known without difficulty, and it will be easily placed in the table I have given in Dipt. Dan. III; it may here I think only be sought under division 8, and here are only two species, *H. nigrina*, which is very different by the dark wings and dull black abdomen, and *quadrifaria*, which has a blackish brown thorax; both species have in the female thickened hind tibiæ.

H. anglodanica was first found in 1911 when I took five specimens on Bornholm in the wood Almindingen; in 1912 it was not uncommon in Dyrehaven at Copenhagen, flying ower ditches; this is somewhat curious, for in the preceding years, when I eagerly collected species of *Hilara* on several localities, I did not at all observe the species. My dates of capture are $^{29}/_{6}$—$^{10}/_{8}$.

When I corresponded with Mr. Collin about the species, he kindly informed me, after having examined it, that it is not uncommon in England, its geographical distribution thus at present being Denmark and England.

Corrections to the paper on the Malacostraca from the Tjalfe-Expedition.

By

K. Stephensen.

Acanthephyra (p. 64).

During a visit to Copenhagen last summer (1912) Cand. real. O. Sund, Assistant at the Fisheries-Investigation in Bergen, Norway, studied the material of the genera *Acanthephyra* and *Pasiphae* preserved in the Zoological Museum in Copenhagen. At the named time I was on a zoological research in Greenland; but Mr. O. Sund has left a note, wherein he writes that all the specimens of *A. purpurea* M. Edw. in our museum do not belong to this species, but to *A. multispina* Coutière, and after my return from Greenland I have convinced my-self that he is right. Accordingly all the Greenland specimens of the genus *Acanthephyra*, also those from the „Tjalfe"-Expedition, in reality belong to *A. multispina*.

A short report will be given in Conspectus Crustaceorum et Pycnogonidorum Groenlandiæ, Meddel. om Grønland vol. 22, 1913, p. 44—47; but later on I intend to give the results of a closer examination in: Crustacea, in Report on the Danish Oceanographical Expeditions 1908—1910 to the Mediterranean and adjacent seas, published at the cost of the Carlsberg Fund under superintendance of Johs. Schmidt, Ph. D.

Boreomysis tridens and **B. nobilis** (p. 78).

On account of a very unfortunate mistake I have on 3 of the labels for *B. tridens* in stead of the right name written *B. nobilis*.

B. nobilis is a true arctic species, that has never been found South of the ridge in the Davis-Strait; my 3 first localities for *B. nobilis* (St. 431: 63° 24′ N, 53° 10′ W, 892 m., trawl. — St. 337: 64° 05′ N, 52° 20′ W, 1100 m., trawl. — St. 407—08: 64° 14′ N, 55° 55′ W, 839 m., clay, trawl) are thus to be referred to *B. tridens*.

20.—2.—1913.

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Aut. d. Westergaard del. T.N. Möller sc.

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Aut. del.

T. N. Möller sc.

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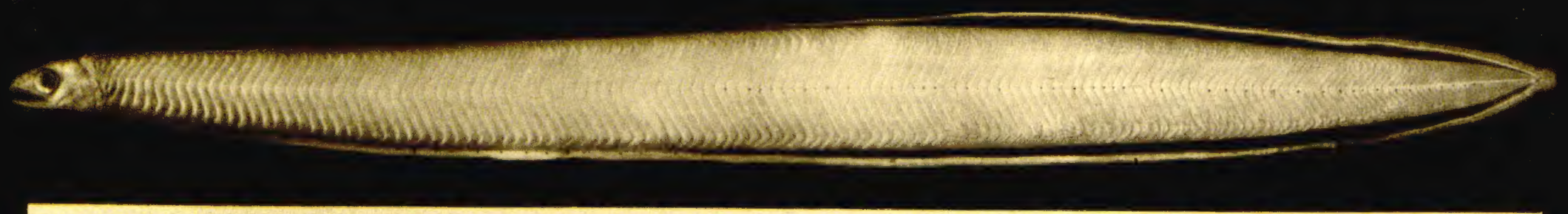

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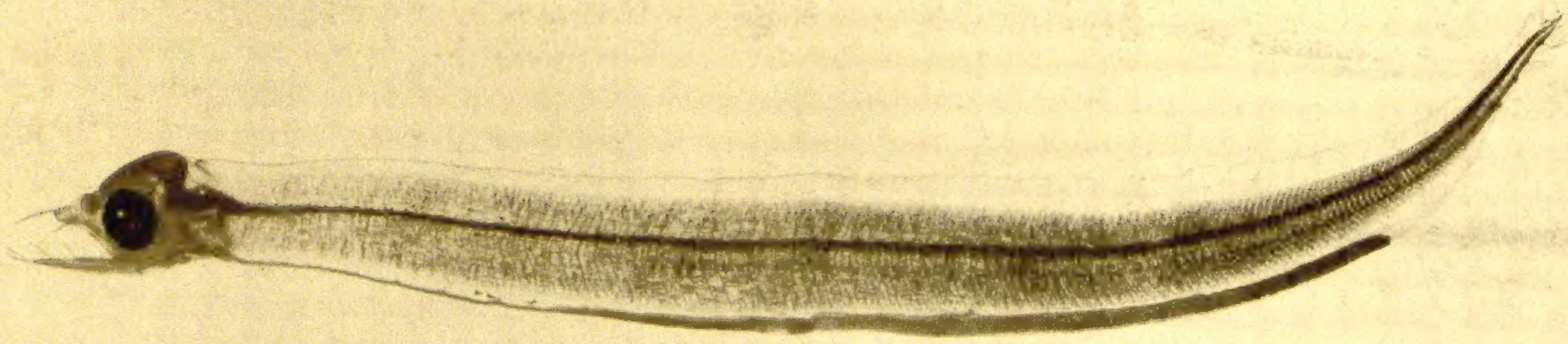

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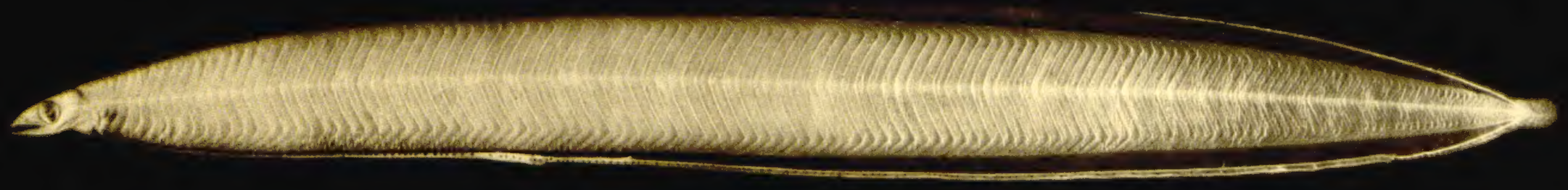

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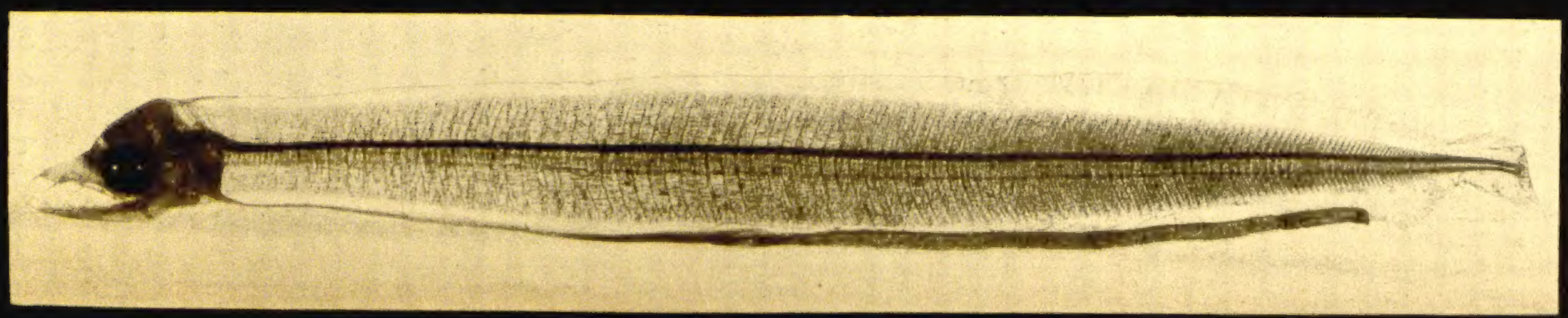

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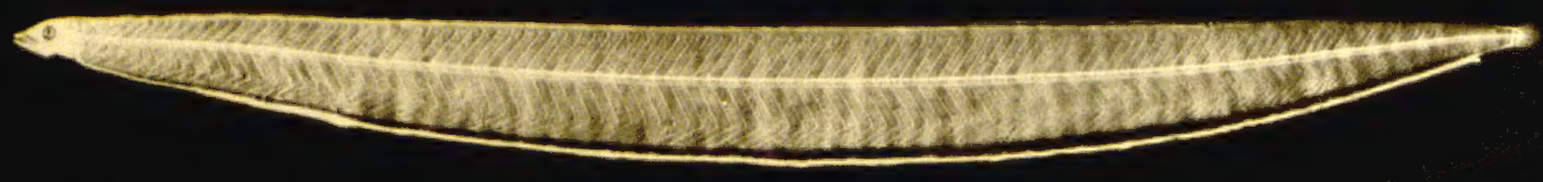

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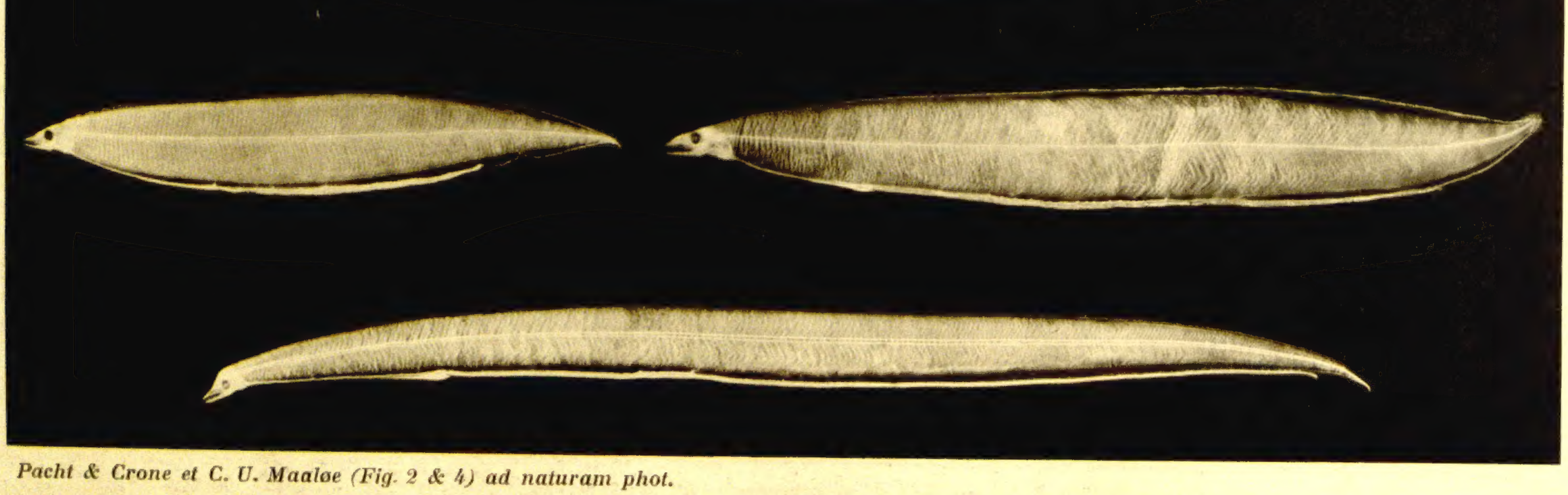
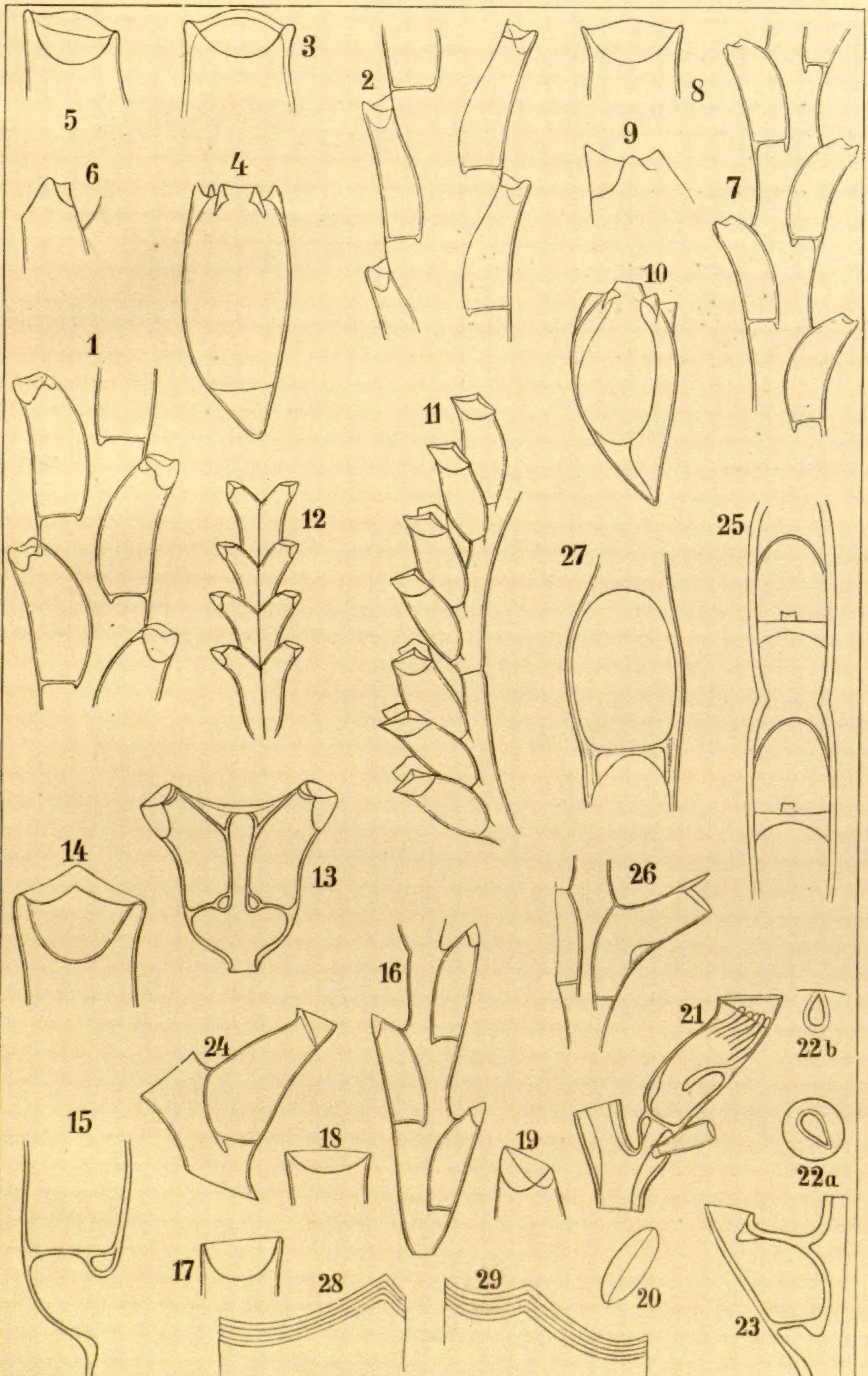


Pacht & Crone et C. U. Maaløe (Fig. 2 & 4) ad naturam phot.

Fig. 1—2, *Conger vulgaris.* — Fig. 3—4, *Conger (Congromuraena) mystax.* — Fig. 5, *Conger (Congromuraena) balearicus* aff. = *Leptocephalus Eckmani,* Strömman, emend. — Fig. 6, *Conger (Congromuraena) balearicus.* — Fig. 7, *Leptocephalus lanceolatus,* Strömman, emend. — Fig. 8, *Leptocephalus ingolfianus,* n. sp. — Fig. 9, *Leptocephalus Andreae,* n. sp.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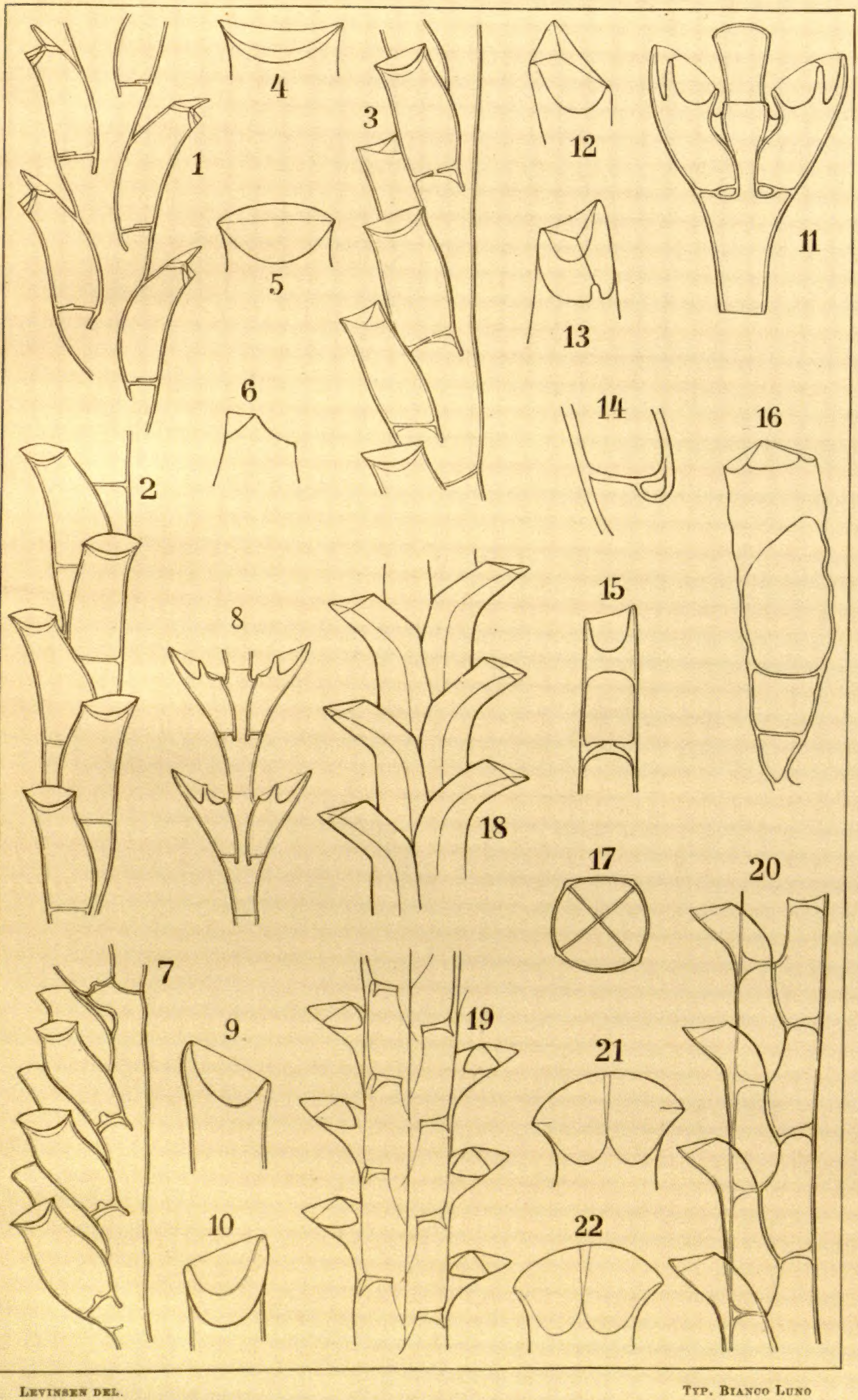
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DANMARK

Fyr, Fyrskib.

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FALSTER
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Bornholm
Vendsyssel
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Aarhus
Horsens
Odense
Ribe
Randers
Store Belt
Lille Belt
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Hjörring
Frederikshavn
Hirtsholm
Læsö Trindel
Nordre Rön
Læsö Rende
Kobbergrunden
Östre Flak
Hanstholm
Thisted
Lögstör
Nibe
Egense
Lodbjerg
Thyborön Kanal
Nykjöbing
Lemvig
Skive
Struer
Holstebro
Silkeborg
Herning
Ringkjöbing
Lyngvig
Hobro
Mariager
Udbyhöj
Gjerrild
Fornæs
Grenaa
Ebeltoft Vig
Ebeltoft
Hjelm
Schultz's Grund
Hesselö
Nakkehoved
Kappegrunden
Kronborg
Helsingör
Spotsbjerg
Frederiksværk
Hillerød
Frederikssund
Nykjöbing
Sejrö
Thuno
Vestborg
Refsnæs
Kallundborg
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Roskilde
KJØBENHAVN
Middelgrunden
Trekroner
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Ytre Rös
Dragör
Amager
Sund
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Sorö
Köge
Slagelse
Halskov
Nyborg
Korsör
Skjelskör
Nastved
Storehedinge
Stevns
Præstö
Omö
Holmo
Faaborg
Svendborg
Assens
Bogense
Middelfart
Kolding
Fredericia
Skjb
Ebelö
Varde
Esbjerg
Vyl
Skallingen
Grandyb
Blaavands Huk
Sönderhavet
Vejle
Horns Rev
Ærösköbing
Marstal
Tranekjær
Rudkjöbing
Taars
Nakskov
Saxkjöbing
Maribo
Nykjöbing
Rödby
Nysted
Kjels Nor
(Falckenberg)
Hyllekrog
Gjedser
Gjedser Rev
Möen
Stege
Vordingborg
Orø
Harbolle
Grönsund
Hastehoved
Skibbekjöbing
Hammeren (Hammershus)
Christiansö
Hasle
Rönne
Aakirkeby
Snarkie
Nexö
Dueodde
Strömö
Östero
Myggenæs
Vaagö
Tofte
Vaalsö
FÆR-ÖERNE
Sandö
Sudero
Tverøa
Salgatange
Sumbö
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Ringkjöbing
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Skanderborg
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